

Research Article

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Crinipus leucozonipus Hampson, 1896 – a new genus and species for the palaearctic fauna (*Lepidoptera*, *Sesiidae*)

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Abstract: *Crinipus leucozonipus* Hampson, 1896 – a new genus and species for the palaearctic fauna (*Lepidoptera*, *Sesiidae*). *Cesa News* 101: 1-6, 5 figs.

Crinipus leucozonipus Hampson, 1896 (*Lepidoptera*, *Sesiidae*) is recorded for the Palaearctic fauna for the first time. The illustrations of imago and male genitalia are given.

Key words: *Lepidoptera*, *Sesiidae*, *Crinipus leucozonipus*, Israel, Palaearctic Region, new record.

Introduction

The clearwing moth fauna of Israel is still poorly known. At present, we have at hand only a few papers dealing with these extremely interesting moths of the region. First of all, we have to mention a work dealing with *Sesiidae* collected by Freina and Lingenhöle during their collecting trip to Israel in 1999 (de Freina, Lingenhöle, 2000). They caught and published data about 12 species, one of them, *Synanthedon stomoxiformis levantina* de Freina & Lingenhöle was described as a new subspecies. Besides that, they have suggested findings at least 11 species more in future. One of them, *Synanthedon vespiformis* (Linnaeus, 1761), was collected at Kefar Tabor in 2010

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(Levi-Zada et al., 2011). However, Freina and Lingenhölle did not expect to find such a unique Sesiidae in Israel as *Crinipus leucozonipus* Hampson, 1896.

Only four specimens of a single species of the clearwing moth family Sesiidae (*Lepidoptera*) were collected by Colonel J.W. Yerbury and Captain C.G. Nurse during their voyage to Aden in 1894-1895. These specimens were described as new species and genus, *Crinipus leucozonipus*, by Sir G.F. Hampson in 1896 (Hampson, 1896). It has hitherto been known from Aden, Yemen and Riyadh, Saudi-Arabia only (Bartsch, 2010). We record this species for Israel and for Palearctic for the first time.

As for the position of *Crinipus* in the modern system of the family, it is unclear and requires thorough revision of the clearwings of the whole Afrotropical region, to which this genus belongs to by its origin.

The material studied or mentioned herein is kept in the following collections abbreviated as follows: BMNH — The Natural History Museum, London, England; MNHP — Museum National d'Histoire Naturelle, Paris, France; COGM — Collection Oleg G. Gorbunov, Moscow, Russia; CJMM — Collection Josef Mooser, Munich, Germany.

***Crinipus leucozonipus* Hampson, 1896 (Figs. 1-4, 5A-D)**

“Crinipus leucozonipus, n. sp.” — Hampson, 1896: 277, pl. 10, fig. 21. Type locality: “Aden, (Yerbury, Nurse)” [= Yemen, Aden]. Syntypes: 3 males (BMNH), 1 female (MNHP) (Bartsch, 2010).

Hampson, 1919: 54; Dalla Torre, Strand, 1925: 5; Gaede 1929: 518; Heppner, Duckworth, 1981: 41; Pühringer, Kallies, 2004: 43; Bartsch, 2010: 38.

This interesting species of the clearwing moths, which is the type species of the genus *Crinipus*, has been known only from seven specimens. The type series contains four syntypes. Three males are deposited in BMNH and one female in MNHP (Bartsch, 2010). According to the labels all syntypes were taken in March and April (Bartsch, 2010). In his revision of the genus *Crinipus* Hampson, 1896 D. Bartsch mentioned additional 2 males and 1 female (Bartsch, 2010), which were collected in Riyadh in March.

In the mid of March 1988 in the vicinity of Eilat of Southern Israel G. Müller and J. Mooser caught two males of a clearwing moth. After careful study it turned out that they belong to *Crinipus leucozanipus* Hampson, 1896. This finding was very surprising, since until now this species was known in the Arabian Peninsula only. Despite the fact that this clearwing moth has been known from Riyadh, it is never included in the Palearctic fauna (Špatenka et al., 1999). Thus, this finding is not only a first for Israel, but for the entire Palearctic Region.

A rather complete redescription of the morphology including the pictures of male genitalia has been published by Bartsch, 2010. The illustrations of the collected moths and the male genitalia are presented herein.

Unfortunately, we know nothing about a host plant of the species. It is clear that it is on the wing in March and April.

Material. 1 male (Figures 1, 2), Israel, 10 km North of Eilat, mid March 1988, G. Müller & J. Mooser leg. (Picture \$\$ Sesiidae 0629-0630-2014/Photo by O. Gorbunov) (CJMM); 1 male (Figures 3, 4, 5A-D), same locality and date, G. Müller & J. Mooser leg. (Picture ## Sesiidae 0631-0632-2014/Photo by O. Gorbunov) (Genital preparation # OG-08-2014) (COGM).

Acknowledgements

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Figure 1 - *Crinipus leucozonipus* Hampson, 1896, male, Israel, 10 km North of Eilat, mid March 1988, G. Müller & J. Mooser leg. (Picture ## Sesiidae 0629-0630-2014/Photo by O. Gorbunov) (CJMM). Alar expanse 17.2 mm.



Figure 2 - ditto, underside.



Figure 3 - *Crinipus leucozonipus* Hampson, 1896, male, Israel, 10 km North of Eilat, mid March 1988, G. Müller & J. Mooser leg. (Picture ## Sesiidae 0631-0632-2014/Photo by O. Gorbunov) (Genital preparation # OG-08-2014) (COGM). Alar expanse 17.4 mm.



Figure 4 - ditto, underside.

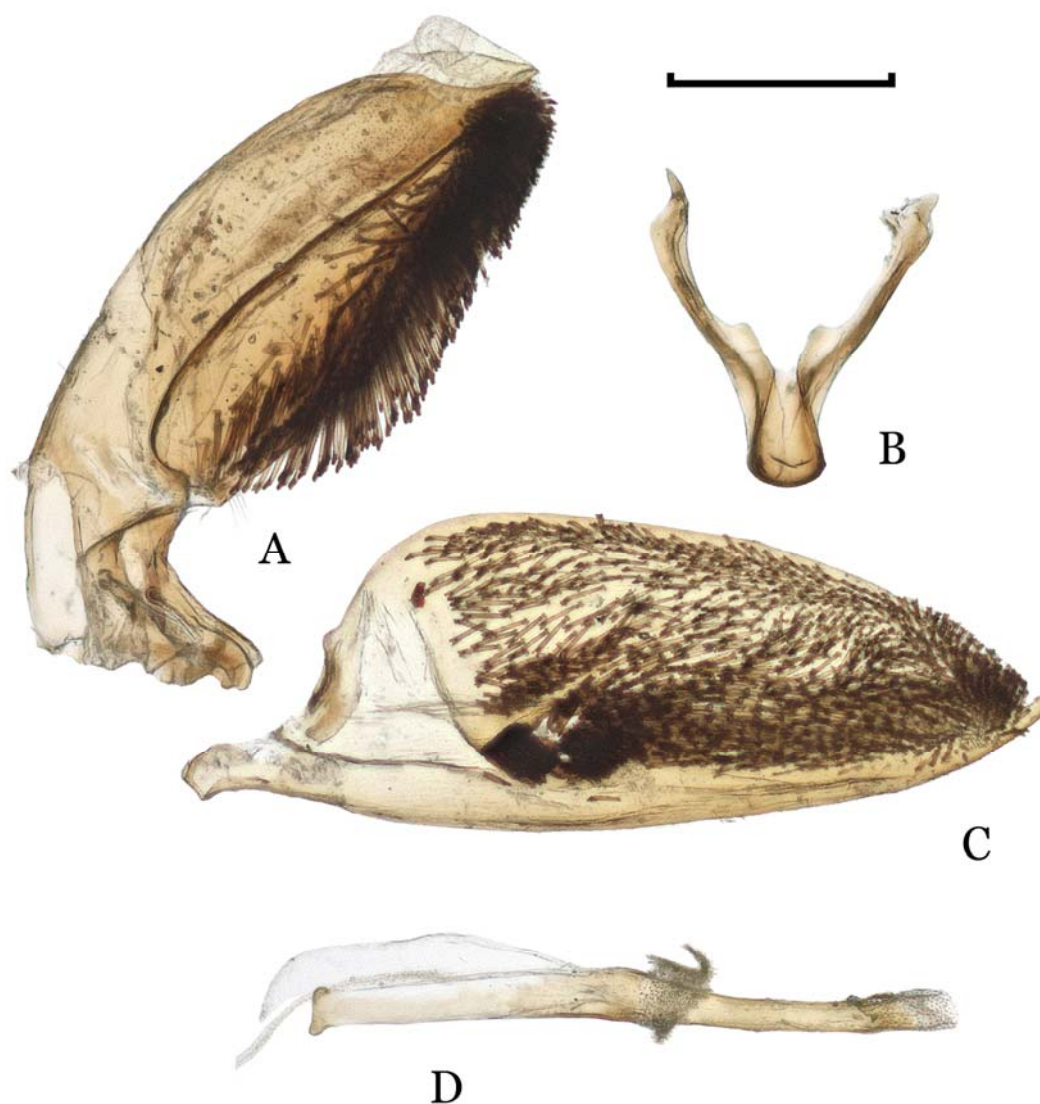


Figure 5 - *Crinipus leucozonipus* Hampson, 1896, male: genitalia (Genital preparation # OG-08-2014): (A) tegument-uncus complex; (B) valva; (C) saccus; (D) aedeagus. Scale bar: 0.5 mm.

Research Article

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An annotated list of the *Sarcophaginae* (*Sarcophagidae*) recorded in Ukraine (*Diptera*)

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Abstract: An annotated list of the *Sarcophaginae* (*Sarcophagidae*) recorded in Ukraine (*Diptera*). *Cesa News* 101: 7-81.

An annotated list of 99 sarcophagine species from 25 genera is presented: *Agriella gavrylenkoi*, *Blaesoxipha cochlearis*, *B. confusa*, *B. grylloctona*, *B. litoralis*, *B. plumicornis*, *B. redempta*, *B. rufipes*, *B. unguata*, *B. unicolor*, *Servaisia erythrura*, *S. rossica*, *Tephromyia grisea*, *Helicophagella agnata*, *H. crassimargo*, *H. noverca*, *H. novercoides*, *H. pseudagnata*, *H. rosellei*, *H. dreyfusi*, *H. macrura*, *H. melanura*, *Discachaeta arcipes*, *D. cucullans*, *D. pumila*, *Heteronychia mutila*, *H. siciliensis*, *H. belanovskyi*, *H. bulgarica*, *H. chaetoneura*, *H. consanguinea*, *H. depressifrons*, *H. dissimilis*, *H. haemorrhoides*, *H. lacrymans*, *H. mazurmovitshi*, *H. pauciseta*, *H. proxima*, *H. rohdendorfi*, *H. rohdendorfiana*, *H. schineri*, *H. slovaca*, *H. vagans*, *H. vicina*, *H. boettcheri*, *H. filia*, *H. filiola*, *Karovia hirticrus*, *Asceloctella granulata*, *Bellieriomima subulata*, *Krameromyia anaces*, *Myorhina nemoralis*, *M. lunigera*, *M. nigriventris*, *M. pandifera*, *M. socrus*, *M. soror*, *M. villeneuvei*, *M. nemoralis*, *Pandelleana protuberans*, *Sarina olsouffjevi*, *S. sexpunctata*, *Thyrsochasma incisilobata*, *T. kentejana*, *Bercaea africa*, *Liopygia argyrostoma*, *L. crassipalpis*, *L. uliginosa*, *Liosarcophaga dux*, *L. emdeni*, *L. jacobsoni*, *L. parkeri*, *L. portschinskyi*, *L. tuberosa*, *L. similis*, *Parasarcophaga albiceps*, *Robineauella pseudoscoparia*, *R. caerulescens*, *Sarcophaga bachmayeri*, *S. baraschi*, *S. bergi*, *S. carnaria*, *S. jupalnica*, *S. hennigi*, *S. lehmanni*, *S. moldavica*, *S. mouchajosefi*, *S. schusteri*, *S. serbica*, *S. subvicina*, *S. ukrainica*, *S. variegata*, *S. zumptiana*, *Kramerea schuetzei*, *Rosellea aratrix*, *Ravinia pernix*, *Sarcotachinella sinuata*. Four species are firstly recorded for Ukrainian fauna: *Heteronychia chaetoneura*, *Sarcophaga baraschi*, *S. jupalnica* and *S. mouchajosefi*; last species and *S. wiesenthalii* firstly reported for Slovakia too. *Blaesoxipha bakweria* Lehrer & Omgba, 2013, syn. nov., firstly synonymised with *Blaesoxipha rufipes* (Macquart, 1839). The quantity of all known species of sarcophagids from Ukraine (179) includes not less than 90% of real species composition.

Key words: *Sarcophaginae*, *Sarcophagidae*, *Diptera*, Ukraine, list, fauna.

Sarcophagid flies are grey, rarely sandy or yellow-grey to almost black; robust or slender flies varying in size (2.0-22.0 mm). 405 genera and 2834 species are distributed in all continents, with an exception of the Arctic and Antarctic. *Sarcophagidae* divided into 5 subfamilies: *Macronychiinae* (1 genus and 21 species), *Miltogrammatinae* (56 genera and 655 species), *Eumacronychiinae* (7 genera and 44 species), *Paramacronychiinae* (19 genera and 80 species), *Sarcophaginae* (320 genera and 2034 species). The genera and subgenera of *Sarcophaginae* and order of their sequence in list are presented according to taxonomic reviews (Giroux & Wheeler, 2010; Povolný & Verves, 1997; Richet et al., 2013; Rohdendorf, 1965, 1970; Verves, 1985, 1986, 1989, 1993; Verves & Khrokalo, 2006; Xue & Verves, 2009; Xue et al., 2011). 178 species have been found in Ukraine including results of present article (table 1). The general distributional data are given after Draber-Moňko (2007), Kara & Pape (2002), Kejval (2011), Khrokalo & Verves (2009), Koçak (2014), Koçak & Kemal (2012), Pape (1996), Pape et al. (2002), Pape & Merz (1998), Pekbey & Hayat (2010, 2013a, b), Peris et al., (1994, 2001), Povolný & Verves (1990), Prado e Castro et al.

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(2010), Raffone (2009), Richet (1991), Richet et al. (2011), Rudzinski (1999), Verves (1978a, b, 1986, 1990, 1998, 2000, 2001, 2003, 2004, 2010, 2013), Verves & Khrokalo (2006, 2009), Verves & Szpila (2011), Verves et al. (1984, 2005), Whitmore (2011), Whitmore et al. (2008).

Material and Methods

The first regional records are asterisked (*). The data on Ukrainian Regions ("Oblasts") are given in alphabetical order. Krym Autonomy is designated as "Crimea". The data on territories of native Kyiv City and Kyiv Region are separated. The points of more detailed investigations are such (given in alphabetical order):

Cherkasy region: Kaniv District: Kaniv State Nature Reserve, annual;

Chernigiv Region: Ichnya District: "Trostyanetz" dendrological park, meadows, bushes and wood, 4-13.08.1999; Borzna District, environs of Yaduty village, meadows, bushes, pine forests, sandy areas, 7-12.07. and 16-25.08.2000;

Crimea: Bakhchysarai District: environs of Beregove village, dry meadows and loamy sea shore, 31.07-11.08.2004;

Crimea: Lenino District: Qazan Tip State Reserve: stones and dry steppe areas, 17-29.07.2007;

Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, meadows and bushes, 4-15.06.2000.

Kherson Region: Chornomorsky [= Black Sea] Biosphere Reserve, sandy areas, 18-29.07.2006;

Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, sandy and dry steppe areas, 7-26.07.1998;

Kyiv City and its environs, stations;

Poltava Region: Pyryatyn and Grebinky Districts: several localities; sandy areas, bogs, meadows, bushes, forest borders etc. 8-18.07.2009; 13-18.07.2010; Sumy Region: Romny City, sandy areas, meadows and bushes at banks of Romenka river, 21-27.08.2009;

Vinnytsia Region: Chechelnyk District: meadows, bushes, forest borders, 26.-27.05, 6.-29.07.2013;

Zakarpattia Region: Uzhgorod District: Nyzhne Solotvyno village, mesophytic meadows and forest borders, 16-23.08.2014.

Zaporizhzhya Region: Pryazovske District: Stepanivka village, sandy areas, 10-26.08.1997.

Abbreviations of states' names present according to MFI country codex.

The determinations of specimens have been carried out with using of a stereomicroscope Leica M205C (Leica Microsystems, Wetzlar, DE).

List of species

Tribe *Protodexiini* Subtribe *Protodexiina*

1. *Agriella gavrylenkoi* Verves & Szpila, 2011

Distribution: Palaearctic: Europe: UA: Kherson Region. ⁴

2. *Blaesoxipha cochlearis* (Pandellé, 1896)

Distribution: Palaearctic: Europe: BG, CH, CZ, DE, ES, FR, GE, HR, HU, IT, MK, PL, RO, RS, RU (Rostov and Voronezh Regions), SI, SK, UA; North Africa: DZ; Asia: AM, AZ, CN (Gansu, Liaoning, Xinjiang), JP (Honshu), KG, KP, KR, KZ (East Region), MN, RU (Altai, Amur, Astrakhan,

⁴ Only one specimen, holotype (♂) is known.

Buryatia, Chita, Dagestan, Irkutsk, Novosibirsk and Primorye Regions), TJ, TR. UA: Cherkasy, Dnipropetrovsk, Kherson and Poltava Regions.

Larvae are internal parasites of nymphs and adults of different orthopteran hosts⁵: Acrididae: *Eurenephillus longipennis* (Artamonov, 1985, 1988); Tettigonidae: *Barbitistes fisheri* (Léonide & Léonide, 1972), *Decticus albifrons* (Delassus, 1925; Léonide & Léonide, 1972), *Ephippiger ephippiger* (Léonide & Léonide, 1972), *Gampsocleis schelkovnikovae* (Olsoufjev, 1929), *Pholidoptera chabrieri* (Léonide & Léonide, 1972), *P. femorata*, *Platypleis denticulata* (Pape, 1994), *Tettigonia viridissima*, and Gryllidae: *Gryllus* sp. (Léonide & Léonide, 1972). Larvae are developed usually during 4-5 days, sometimes to 7 days in host body, puparium in soil – during 9-11 days. Females larvaeposit not more than 60 larvae; the time of copulation is 18-50 min (Léonide & Léonide, 1972, 1986).

Material examined: Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, meadow, at flowers of *Heracleum* sp., 5.-6.08.2000, 2 ♂; Fedorivka village, meadows along Samara River, 1.08.2000, 3 ♂. Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, old mulberry plantation, on drop, 16.-24.07.1998, 20 ♂ (Yu. Verves).

3. *Blaesoxipha confusa* Villeneuve, 1912

Distribution: Palaearctic: Europe: HU, RU (Rostov and Orenburg Regions), UA; Asia: KZ (Astana Region), RU (Chelyabinsk and Sverdlovsk Regions), UA: Cherkasy Region.

Flies prefer dry meadows, steppe and semidesert habitats (original data).

4. *Blaesoxipha grylloctona* Löw, 1861

Distribution: Palaearctic: Europe: AT, BG, CH, DE, DK, ES, FI, FR (mainland), IT (mainland), LI, PL, RS, RU (Leningrad Region), UA; North Africa: EG, PT (Azores); Asia: AF, AZ, CN (Liaoning), IL, IR, JP (Honshu); KR, KZ (Kokchetau Region), MN, RU (Buryatia, Khabarovsk and Primorye Regions), SA, TJ, TR. UA: Cherkasy, Dnipropetrovsk*, Kyiv and Zhytomyr Regions.

Larvae are internal parasites of nymphs and adults of locusts *Aeropedellus variegatus*, *Ailopus strepens* (Pape, 1994), *Chorthippus biguttulus*, *C. brunneus* (Léonide & Léonide, 1982), *C. longicornis* (Pape, 1994), *C. mollis*, *C. parallelus* (Léonide & Léonide, 1982), *Locusta migratoria* (Olsoufjev, 1930), *Omocestus ventralis* (Léonide & Léonide, 1982), *Pezotettix albina* (Löw, 1961), *Podisma alpina* (Pape, 1994), *P. pedestris* (Löw, 1961), *Schistocerca gregaria*, *Stenobothrus lineatus* (Pape, 1994). Flies were collected at altitudes not more than about 2500 m o. s. l. (Pekbey & Hayat, 2013a). Adult flies feed on flowers and aphids' excreta and prefers mesophytic steppe, meadows and bushes (Verves & Khrokalo, 2006).

Material examined: Dnipropetrovsk Region: Novomoskovsk District: Bogatyrsk biological station of Melitopol State Pedagogical University, feather grass steppe, 6.08.2000, 2 ♂ (Yu. Verves).

5. *Blaesoxipha litoralis* (Villeneuve, 1911)

Distribution: Palaearctic: Europe: BG, CH, ES, FR (south part and Corsica), HU, IT (mainland, Sardinia and Sicily), RO, RS, RU (Orenburg Region), UA; North Africa: DZ, MA; Asia: AM, AZ, GE, IR, KR, KZ, RU (Altai, Chita and Dagestan Regions), SY, TJ, TM, TR, UZ. UA: Crimea, Kherson, Mykolaiv, Odesa*, Poltava and Zaporizhzhya Regions.

Larvae are internal parasites of nymph and imago of Acrididae: *Calliptamus italicus* (Charykuliev, 1965), *Dociostaurus maroccanus* (Léonide, 1983), *Locusta migratoria* (Rohdendorf, 1928) in natural habitats and *Pezotettix giornai* under laboratory conditions (Léonide & Léonide, 1986). Females infest the hosts throughout its genitoanal opening (Léonide & Léonide, 1977). Adult flies prefer dry meadows, steppe, bushes and ground roads and feed on flowering plants (Verves & Khrokalo, 2006); were found in mountains at altitudes up to 2300 m a. s. l. (Pekbey & Hayat, 2013a).

⁵ The bionomics data about sarcophagids flies as orthopteran parasites were generalized by Greathead (1963, 1992), Léonide & Léonide (1986), Pape (1994), Rees (1973) and Verves (1985, 1993)

Material examined: Crimea: Bakhchisaray District: Bakhchisaray City: stoned hill, 400 m a. s. l., 12.08.1996, 2 ♂; Beregove village, sandy area and loam sea shore, 11-23.08.1996, 4 ♂; 24.08.2001, 1 ♂; Lenino District: Qazan Tip State Reserve, 23-29.07.2007, 14 ♂. Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, sandy and dry steppe areas, 7, 8, 14.-16. and 22.07.1998, 69 ♂; old mulberry plantation, on drop, 19-20. and 23-24.07.1998, 31 ♂; Mykolaiv Region: Ochakiv District: Parutino village, debris of antic Olvia City, 16.07.2006, 1 ♂ (Yu. Verves). Odesa Region: Ismail District: Kyslytzya village, 15 km SE, 2.08.2009, 1 ♀; 5 km SE, 7-9.08.2009, 4 ♂ (V. Gorobchysyn, Yu. Protzenko). Zaporizzhya Region: Berdyansk City: sandy spit at Azov Sea, 14-17.08.1994, 1 ♀; Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 8 ♂, 1 ♀; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 26.08.1997, 1 ♀ (Yu. Verves).

6. *Blaesoxipha plumicornis* (Zetterstedt, 1859)

Distribution: Palaearctic: Europe: AL, AT, BE, BG, BY, CH, CZ (Moravia), DE, DK, ES, FI, FR (mainland and Corsica), HR, HU, IT (mainland and Sardinia), LT, LV, MD, NL, NO, PL, RS, RU (Bashkortostan, Leningrad, Moscow, Orenburg and Voronezh Regions), SE, SK, UA, UK (England); North Africa: EG, PT (Madeira); Asia: AF, AM, AZ, CN (Jilin, Liaoning, Xinjiang), EG (Sinai), GE, IL, IR, JP (Honshu), KG, KP, KR, KZ, MN, RU (Altai, Amur, Chita, Dagestan, Irkutsk, Jewish Autonomy, Khabarovsk, Kurily, Magadan, Primorye and Sakhalin Regions), SA, TJ, TM, TR, UZ. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Kharkiv, Kherson, Kirovograd, Kyiv, Luhansk, Mykolaiv, Poltava, Rivne, Sumy, Zakarpattia, Zaporizzhya and Zhytomyr Regions.

Larvae are internal parasites of nymphs and imagoes of locusts *Acrotylus insubricus* (Olsoufjev, 1929), *Aeropedellus variegatus* (Zakhvatkin, 1954), *Ailopus tergestinus* (Olsoufjev, 1929), *Calliptamus* sp. (Peris et al., 2001), *C. italicus* (Olsoufjev, 1929), *Chorthippus albomarginatus* (Zakhvatkin, 1954; Verves, 1974, 1987), *C. apricarius* (Verves, 1974, 1987), *C. brunneus* (Clemons, 1998, 2002; Richards & Waloff, 1954), *C. kozhevnikovi* (Olsoufjev, 1929), *C. longicornis* (Richards & Waloff, 1954), *C. millis* (Verves, 1974, 1987), *C. parallelus* (Clemons, 1998, 2002), *Chrotogonius turanicus* (Olsoufjev, 1929), *Dociostaurus maroccanus* (Melis, 1934), *Euchorthippus declivus*, *Euthysira brachyptera* (Pape, 1994), *Locusta migratoria* (Olsoufjev, 1929; Rohdendorf, 1932; Rukavishnikov, 1930), *Myrmeleotettix maculatus* (Richards & Waloff, 1954), *Oedaleus decorus* (Léonide & Léonide, 1979), *Oedipoda coerulescens* (Léonide & Léonide, 1979; Verves, 1974, 1987), *O. germanica* (Léonide & Léonide, 1979), *O. miniata*, *Omocestus heumonsi* (Olsoufjev, 1929), *O. ventralis* (Pape, 1994), *O. viridulus* (Clemons, 1998, 2002; Richards & Waloff, 1954), *Paracinema tricolor bisignata* (Peris et al., 2001), *Podisma pedestris* (Rohdendorf, 1970), *Pyrgodera armata*, *Pyrgomorpha conica*, *Ramburiella turcomanana* (Olsoufjev, 1929), *Schistocerca gregaria* (Bogush, 1959; Rohdendorf, 1932), *Sphingonotus mecheriae* (Olsoufjev, 1929), *Stauroderus scalaris* (Verves, 1974, 1987). Female fertility consists 75-150 larvae; maggots are developed usually 7 days in host body, puparium in soil – 12-22 days, 3rd stage larvae of last generation overwintering in soil. Females infest the hosts throughout its genitoanal opening at surface of soil. 3-4 generations per year were registered (Léonide & Léonide, 1979; Olsoufjev, 1929; Rukavishnikov, 1930; Zakhvatkin, 1954). Adult flies prefer dry meadows, steppe, bushes and ground roads and feed on flowering plants and aphid excreta (Verves & Khrokalo, 2006); were found in mountains at altitudes up to 2100 a. s. l. (Séguy, 1941).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, Krugly I., 6.06.-16.07.1986 and 22.06.1988, 6 ♂ 2 ♀ (Yu. Verves, S. Zrazhevsky). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, dry meadows near Trubin Lake, 23.08.2000, 2 ♂, 2 ♀. Dnipropetrovsk Region: Novomoskovsk District: Fedorivka village, meadows along Samara River, 1.08.2000, 1 ♂. Kyiv City: Desna District: "Druzhby Narodiv" park, dry meadows, 1.07.2001, 1 ♂; Holosiiv District: Williams street, dry meadows, 28.07.2001 and 19.08.2002, 2 ♂, 1 ♀. Kyiv Region: Kyiv-Sviatoshyn District: 4 km N of Hostomel village, meadows at right bank of Irpin River, 8.07.2001, 1 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 4.06.2003, 2 ♂; Obukhiv District: 4 km W of Ukrainka City, border of pine forest nr Lake, at leaves and ground, 21.08.2004, 1 ♀; Vyshgorod District, Osischyna village, coast of Lake, meadows, 3.06.2007, 6 ♂, 1 ♀. Poltava Region: Pyryatyn District: Lelyaky village, meadows at bank of Uday River, 16.08.2010, 1 ♂, 1 ♀ (Yu. Verves). Luhansk Region: Stanychno-

Luhanska District: Nova Kindrashivka village, sandy area, 1.08.2008, 1 ♂ (A. Drozdovska). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13 and 15.08.2010, 2 ♂; Oleksandrivka village, “Gostra Mogyla” barrow, 14.07.2009, 1 ♀; Zhovtneve village, meadows, 13.07.2009, 2 ♂, 1 ♀ (V. Gorobchyshyn and Yu. Verves). Sumy Region: Sumy District: Mogrytzya village, 7-9.08.2009, 1 ♂ (Yu. Protzenko).

7. *Blaesoxipha redempta* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AL, AT, BA, BG, BY, CH, CZ (Moravia), DE, DK, ES, FI, FR (mainland and Corsica), HR, HU, IT (mainland and Sardinia), LT, MD, MK, MNE, MT, NL, NO, PL, RS, RU (Bashkortostan, Kursk, Orenburg, Perm, Ryazan, Tambov and Voronezh Regions), SE, SI, SK, TR, UA; North Africa: DZ, EG, ES (Canary Is.), LY, MA, TN; Asia: AF, AM, AZ, CN (Hebei, Heilongjiang, Jiangsu, Jilin, Liaoning, Shandong, Xinjiang), GE, IL, IQ, IR, KG, KZ, MN, RU (Amur, Astrakhan, Buryatia, Chita, Dagestan, Irkutsk, Krasnodar, Krasnoyarsk, Primorye, Stavropol, Tuva and Tyumen regions), SA, SY, TJ, TM, TR, UZ. Afrotropical: GH, SD, SO, YE. Oriental: IN (Jammu & Kashmir), TH. Australasian/Oceanian: US (Hawaii)⁶. UA: Cherkasy, Chernigiv, Crimea, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Luhansk, Mykolaiv, Odesa, Poltava, Ternopil, Zakarpattia, Zaporizzhya and Zhytomyr Regions.

Larvae are parasites of adult locusts *Acrida deserta* (Olsoufjev, 1930), *Acrotylus insubricus* (Léonide & Léonide, 1971; Olsoufjev, 1930), *Ailopus chinensis* (Olsoufjev, 1930), *A. strepens* (Pape, 1994), *A. thallasimus* (Olsoufjev, 1930), *Anacridium aegyptium* (Künckel, 1905; Séguy, 1941; Zumpt, 1972), *A. melanorhodon* (Greathead et al., 1994), *Bryodema tuberculata* (Predtechensky, 1928, 1930), *Calliptamus italicus* (Charykuliev, 1976; Jannone, 1934; Léonide & Léonide, 1971; Olsoufjev, 1930; Rukavishnikov, 1930; Séguy, 1941), *C. spretus* (Séguy, 1941), *Celes variabilis* (Vorontzovsky, 1924), *Chorthippus* sp. (Artamonov, 1985), *Chorthippus albomarginatus* (Predtechensky, 1930; Zakhvatrkin, 1954), *C. biguttulus* (Charykuliev, 1976), *C. mollis* (Pape, 1994), *Dericorus tibialis* (Olsoufjev, 1929), *Dociostaurus albicollis* (Vorontzovsky, 1924), *D. brevicollis* (Predtechensky, 1930; Vorontzovsky, 1924), *D. craussi* (Charykuliev, 1976), *D. maroccanus* (Baranov, 1924, 1925, 1927, 1942; Charykuliev, 1976; La Baume, 1918; Léonide, 1983; Léonide & Léonide 1971; Nijazbekov, 2007; Paoli, 1910, 1932, 1939; Vayssière, 1921), *Eirenephillus longipennis* (Artamonov, 1985), *Euchorthippus pulvinarius* (Léonide & Léonide, 1971), *Gampsocleis schelkownikovae* (Olsoufjev, 1930), *Gomphocerus sibiricus* (Vinokurov, 1927; Zakhvatrkin, 1954), *Locusta migratoria* (Chaboussou et al., 1949; Greathead et al., 1994; Nikolsky, 1913; Olsoufjev, 1929, 1930; Polsmann, 1929; Predtechensky, 1928, 1930; Quo, 1954; Remaudière, 1947; Roehrich, 1951; Rukavishnikov, 1930; Zumpt, 1972), *Melanomethis fuscipennis* (Charykuliev, 1976), *Mioscirtus wagneri* (Olsoufjev, 1930), *Oedaleus decorus* (Charykuliev, 1976; Léonide & Léonide, 1971; Vorontzovsky, 1924), *Oedipoda atripes* (Pape, 1994), *O. caerulea* (Léonide & Léonide, 1971; Olsoufjev, 1930; Predtechensky, 1928, 1930; Verves, 1974, 1987), *O. germanica* (Pape, 1994), *O. miniata* (Charykuliev, 1976; Olsoufjev, 1930; Pape, 1994; Rukavishnikov, 1930), *O. schochi* (Olsoufjev, 1930), *Omocestus ventralis* (Pape, 1994), *Parapleurus alliaceus* (Olsoufjev, 1930), *Primnoa primnoides* (Artamonov, 1985), *Psophus stridulus* (Pape, 1994), *Pyrgodera armata* (Charykuliev, 1976), *Ramburiella turcomana* (Charykuliev, 1976; Olsoufjev, 1930), *Schistocerca gregaria* (Greathead et al., 1994; Künckel, 1905; Séguy, 1941; Zumpt, 1972), *S. nitens* (Chong, 1968; Hardy, 1980), *S. peregrina* (Séguy, 1941), *Sphingonotus mecheriae* (Rukavishnikov, 1930), *Stauroderus scalaris* (Verves, 1974, 1987; Zakhvatrkin, 1954), *Stauroderus cruciatus* (Séguy, 1941), *Thisoesetrinus pterostichus* (Olsoufjev, 1929), and Tettigoniidae: *Barbitistes* sp. (Verves & Khrokalo, 2006), *Metrioptera affinis* (Olsoufjev, 1930), *Tettigonia viridissima* (Pape, 1994). In laboratory conditions larvae of fly developed in body of adult locusts *Melanoplus bivittatus*, *M. femurrubrum*, *M. sanguinipes* (Rees, 1970). Female fertility consists 70-225 larvae; larvae are developed usually 4-7 (to 16) days in host body, puparium in soil – 15-20 days; 3rd stage larvae overwintering. 2-3 generation per year were registered. ♀ infested the flying hosts only; they larviposit at random on the hosts and the larvae seek and penetrate an intersegmental or arthrodiol membrane (Baranov, 1925; Charykuliev, 1976; Olsoufjev, 1929, 1930; Pape, 1994; Predtechensky,

⁶ This species have been introduced to Sand Island, Honolulu, Hawaii, for biological control of the locust *Schistocerca nitens*, but not established (Chong, 1968).

1928; Rukavishnikov, 1930; Zakhvatkin, 1954). Flies feed at sugar liquid of homopters, flowering plants, and dead insects; distributed in different types of grass, steppe and desert localities, along ground roads etc. (Artamonov, 1993; Draber-Moňko, 1973; Verves & Khrokalo, 2006) and were collected at altitudes up to 2500 m a. s. l. (Pekbey & Hayat, 2013a).

Material examined: Crimea: Bakhchysaray District: Mangut Kale plateau, 570 m a. s. l. 19.08.1996, 1 ♀ (Yu. Verves). Luhansk Region: Stanychno-Luhanska District: Nova Kindrashivka village, sandy area, 1.08.2008, 1 ♀ (A. Drozdovska). Odesa Region: Ismail District, Maly Taman I., 15. 07.2003, 1 ♀ (Yu. Protzenko). Zakarpattia Region: Mizhgirya District: Kolochava village, 2-4 km S, along stream Kvasonetz, 600-1000 m a. s. l., 12.08.1995, 8 ♂; 5 km W, alp steppe, 1400 m a. s. l., 14.08.1995, 1 ♀; Uzhgorod District: Nyzhne Solotvyno village, 98°33'N, 22°26'E, 140m a. s. l., meadow, 22.08.2014, 1 ♀. Zaporizhzhya Region: Melitopol City: "Kamyany Mogyly" State Reserve, at stones, 28.08.1997, 1 ♀; Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, 23.08.1997, 4 ♀; (Yu. Verves).

8. *Blaesoxipha rufipes* (Macquart, 1839)

Blaesoxipha bakweria Lehrer and Omgba, 2013, **syn. nov.**

Distribution: Palaearctic: Europe: ES, FR (Provence and Corsica), HR, IT (mainland), UA; North Africa: DZ, ES (Canary Is.), EG, MA, PT (Azores); Asia: AF, AM, AZ, CN (Liaoning, Neimenggu, Sichuan), CY, EG (Sinai), GE, IL, IR, JP (Honshu), JO, KR, KZ, KG, LB, MA, MN, RU (Astrakhan Region, Dagestan, Kurgan Region, Primorye, Stavropol Region, Tuva), SA, SY, TJ, TM, TR, UZ. Nearctic: US (California)⁷. Afrotropical: AO, BJ, BW, CG, CI, CM, CV, ET, GM, KE, KM, ML, NA, NG, SL, SN, TZ, TG, YE, UG, ZA (Eastern Cape, Gauteng, Western Cape), ZM. Madagascan: MG. Oriental: CN (Guangdong, Guizhou, Yunnan), ID (Java), IN (Meghalaya, Tamil Nadu), JP (Ryukyu Is.) LA, LK, MY (Sabah, West MY), PH (Palawan, Tawi Tawi), PK, TH, VN. Australasian/Oceanian: AU (New South Wales, Northern Territory, Queensland), FJ, ID (Ambon I.), NC, PW (Ngerkabesang I.), PG (Bismarck Arch., New Guinea); SB (Guadalcanal I.), US (Hawaii)⁸, VU. UA: Zaporizhzhya Region.

Larvae are highly effective endoparasites of nymphs and adults of different brachiceran orthopteran hosts: *Acanthacris ruficornis lineata* (Greathead et al., 1994), *Acrida oxycephala* (Rohdendorf, 1930), *Ailopus thalassinus*, *Anacridium aegyptium*, *A. moestum* (Verves, 1985), *Atractomorpha lata* (Miura & Ohgushi, 2010), *Calliptamus coelesyriens intricatus* (Charykuliev, 1976), *C. italicus* (Léonide, 1983), *Chortoicetes terminifera* (Baker, 1995; Baker & Barchia, 1997; Baker et al., 1982; Farrow, 1982; Gurney, 1908; Kaldor & Baker, 1996; Lopes, 1955), *Cyrtacanthacris tatarica*, *Diabolocatantops axillaris* (Greathead et al., 1994), *Dociostaurus kraussi* (Charykuliev, 1976), *D. maroccanus* (Charykuliev, 1976; Dempster, 1957; Hernandez, 1992; Léonide, 1983), *D. nigrogeniculatus* (Verves, 1985), *Eumigus* sp. (Peris et al., 2001), *Gastrimargus musicus* (Common, 1948), *Epacromius coerulipes* (Verves, 1985), *Kosciuscola cognatus* (Pape, 1994), *Locusta migratoria* (Baker, 1975, 1978; Olsoufjev, 1930), *Locustana pardalina* (Van Someven, 1965), *Mesaspippus kozhevnikovi* (Verves, 1985), *Monistria concinna*, *M. discrepans* (Allsopp, 1978), *Oedaleus* sp. (Verves, 1985), *O. senegalensis* (Amené & Vajime, 1990; Greathead et al., 1994), *Oedipoda miniata* (Verves, 1985), *Phaulacridium vittatum* (Oliver & Croft, 2010), *Phymateus morbillosus* (Greathead et al., 1994; Verves, 1985), *Poecillocerus pictus* (Verves, 1985), *Qualetta maculata* (Pape, 1994), *Ruspolia punctipennis*, *Kraussaria angulifera* (Greathead et al., 1994), *Schistocerca gregaria* (Bogush, 1959; Greathead et al., 1994; Rohdendorf, 1930), *Sphingoderus carinatus*, *Stauronotus* sp. (Verves, 1985), *Tmethis* sp. (Pape, 1994), *Zonocerus elegans* (Greathead et al., 1994), *Z. variegatus* (Armand & Agnès, 2005; Chapman & Page, 1979; Chapman et al., 1986; De Gregorio, 1982; Lehrer & Omgba, 2013; Paraiso et al., 1992; Taylor, 1964; Toye, 1982). Adult fly females parasitized mainly adult creeping females but also but also attacked final instar female nymphs and adult males of hosts (Greathead et al., 1994). 1-4 larvae placed between thoracic muscles in one host; if more than one larva, the host died (Allsopp, 1978). The development of larvae passed during 4-9 days, pupae in soil – 4-15 days (Allsopp, 1978; Baker,

⁷ this species have been introduced into USA from Australia and Pakistan reiterated since 1893; the invasion of American locusts by larvae of this species proved not effective (Clausen, 1978; Rees, 1985)

⁸ introduced: Davis, 1971; Rees, 1985.

1995; Charykuliev, 1976; Taylor, 1964). Adult flies feed at flowering plants and aphid excreta and prefer xerophytic sandy areas in steppes and semideserts (Verves & Khrokalo, 2006).

Material examined: Zaporizzhya Region: Novomoskovsk District, Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 2 ♂ (Yu. Verves).

9. *Blaesoxipha ungulata* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AD, BG, ES, CH, CZ (Bohemia and Moravia), FR (mainland), IT (mainland), PL, RS, RU (Perm Region), UA; North Africa: DZ; Asia: AZ, GE, RU (Krasnodar and Rostov Regions), TR. UA: Cherkasy, Crimea, Dnipropetrovsk and Donetsk Regions.

Larvae are known as endoparasites of different orthopteran hosts, including grasshoppers *Barbitistes fischeri* (Léonide, 1965), *Tettigonia viridissima* (Séguy, 1941) and acrids *Anacridium aegyptium* (Baer, 1921; Léonide & Léonide, 1983), *Calliptamus* sp. (Peris et al., 2001), *Chorthippus mollis* (Léonide & Léonide, 1983), *Dociostaurus maroccanus* (Léonide & Léonide, 1983; Séguy, 1941), *Pyrgomorpha conica* (Léonide & Léonide, 1983). Adult flies were collected on flowers and leaves in humid ecosystems (bushes, meadows, forests etc. (Gudjabidze, 1970; Séguy, 1941). Adult flies were collected at altitudes to 2540 m o. s. l. (Pekbey & Hayat, 2013a).

Material examined: Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, bank of Samara River, humid meadow, at flowers of *Heracleum* sp., 5.08.2000, 2 ♂.

10. *Blaesoxipha unicolor* (Villeneuve, 1912)

Distribution: Palaearctic: Europe: AD, BG, CH, ES, FR (mainland), HU, IT (mainland), RS, RU (Bashkortostan, Leningrad, Orenburg, Kuibyshev and Tver Regions), UA; Asia: AZ, CN (Liaoning, Neimenggu), GE, KZ, MN, RU (Dagestan, Altai, Chita and Irkutsk Regions), SA, TR. Oriental: CN (Guizhou), TH. UA: Cherkasy, Crimea, Dnipropetrovsk, Kherson, Mykolaiv*, Poltava and Zaporizzhya Regions.

Larvae are the parasites of locusts *Aeropedellus variegates* (Zakhvatrkin, 1954), *Bryodemus* sp. (Verves, 1984), *Calliptamus italicus* (Verves, 1985), *Chorthippus albomarginatus*, *C. apricarius*, *C. biguttulus* (Zakhvatrkin, 1954), *Dociostaurus genei*, *D. maroccanus* (Verves, 1985), *Gomphocerus sibiricus* (Zakhvatrkin, 1954), *Euchorthippus pulvinatus*, *Oedaleus decorus*, *Ramburiella hispanica*, *Sphingonotus caeruleus* (Verves, 1985), *Stauroderus scalaris*, *Stenobothrus eurasius*, *S. nigromaculatus* (Zakhvatrkin, 1954). Flying females larviposit on the body surface of sitting or creeping hosts; than larvae penetrating through the intersegmental membrane (Zakhvatrkin, 1954). Flies feed on flowering plants; prefer xerophytous or mesophytous meadows, steppe, sandy areas, ground roads (Verves & Khrokalo, 2006). Female fertility consists 70-120 larvae; 2 generation per year registered. Flies were collected at altitudes to 700 m o. s. l. (Wei, 2007).

Material examined: Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, feather grass steppe, 6. & 8.08.2000, 32 ♂. Kherson Region: Genichesk District: Chernigivka village, old mulberry plantation, on drop, 20. and 24.07.1998, 2 ♂. Mykolaiv Region: Ochakiv District: Parutino village, debris of antic Olvia City, 16.07.2006, 1 ♂. Poltava Region: Pyryatyn District: Grabarivka village, meadows near Ruda River, 15.07.2009, 1 ♂. Zaporizzhya Region: Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 1 ♂ (Yu. Verves).

11. *Servaisia* (s. str.) *erythrura* (Meigen, 1826)

Distribution: Palaearctic: Europe: AT, BG, BY, CH, CZ (Bohemia and Moravia). DE, DK, EE, ES, FI, FR (mainland), GR (mainland), HR, HU, IT (mainland), LT, LV, PL, RO, RS, RU (Kaluga, Leningrad, Moscow, Orenburg, Perm, Voronezh and Yaroslavl Regions), SE, SK, UA, UK (England); Asia: AM, AZ, CN (Gansu, Liaoning, Neimenggu, Shanxi, Quinghai, Xinjiang), GE, KG, KZ, MN, RU (Altai, Buryatia, Chita, Dagestan, Irkutsk, Khabarov, Krasnodar, Primorye, Stavropol and Tobol Regions), TJ, TM, TR. UA: Cherkasy, Kyiv and Zakarpattya Regions.

Larvae are the internal parasites of nymphs and adult acridids *Chorthippus apricarius*, *C. biguttulus* (Olsoufjev, 1929), *C. longicornis*, *Chrysochraon dispar* (Verves, 1985), *Omocestus*

petraeus (Pape, 1994), *O. viridulus* (Olsoufjev, 1929), *Pezotertix* sp. (Portschinsky, 1894), *Stenobothrus lineatus* (Pape, 1994). Adult flies feed on flowers of *Rhamnus frangula* L. (Draber-Mońko, 1973), *Bupleurum* sp., *Euphorbia* sp. (Zakhvatrkin, 1954), and associated with cultural steppes (Kejval, 1998), chalk grasslands and limestone hillsides (Rudzinski & Flügel, 2007), tips of hills in xerophytic stations (Zakhvatrkin, 1954). In the northern part of specific areal flies prefers flats, and in southern one they live in mountains (Rohdendorf, 1928) up to altitude 2600 m o. s. l. (Pekbey & Hayat, 2013a).

Material examined: Kyiv City: Holosiiv District, "Sovky hole", humid meadow, at flowers of *Taraxacum officinale*, 2.09.2013, 1 ♂ (Yu. Verves).

12. *Servaisia* (s. str.) *rossica* (Villeneuve, 1912)

Distribution: Palaearctic: Europe: AT, BG, DE, CH, CZ (Moravia), DK, EE, ES, FI, FR (mainland and Corsica), HR, HU, IT (mainland and Sicily), MK, NO, PL, RO, RS, RU (Bashkortostan, Kirov, Kursk, Moscow, Leningrad, Orenburg, Ryazan, Tambov, Tatarstan and Voronezh Regions), SE, SK, UA, UK (England); North Africa: MA; Asia: AM, AZ, CN (Heilongjiang, Jilin, Liaoning, Neimenggu, Shanxi, Sichuan, Xinjiang), GE, KG, KZ, MN, RU (Altai, Amur, Buryatia, Irkutsk, Khabarovsk, Krasnodar, Primorye and Stavropol Regions); SY, TJ, TR, UZ. UA: Cherkasy, Chernigiv, Crimea, Dnipropetrovsk, Donetsk, Khmelnytsky, Kyiv, Poltava, Ternopil and Zakarpattia Regions.

The larvae are the parasites of nymphs and adults of acridids *Chorthippus albomarginatus*, *C. apricarius* (Verves, 1974, 1987), *C. biguttulus* (Léonide, 1967; Léonide & Léonide, 1971), *C. brunneus* (Léonide & Léonide, 1971; Verves, 1974, 1987), *C. mollis* (Léonide, 1967; Léonide & Léonide, 1971), *C. parallelus* (Zakhvatrkin, 1954), *Dociostaurus maroccanus* (Léonide, 1983), *Eirenephillus longipennis* (Artamonov, 1988), *Euchorthippus declivus* (Léonide, 1967; Léonide & Léonide, 1971), *E. pulvinatus* (Léonide & Léonide, 1971), *Gomphocerus rufus* (Pape, 1994), *G. sibiricus* (Rohdendorf, 1937), *Locusta migratoria* (Olsoufjev, 1930; Predtechensky, 1930), *Oedipoda germanica* (Pape, 1994), *Omocestus haemorrhoidalis* (Verves, 1974, 1987; Zakhvatrkin, 1954), *O. ventralis* (Pape, 1994), *O. viridulus*, *Primnoa primnoides* (Olsoufjev, 1930), *Stauroderus scalaris* (Verves, 1974, 1987). The larvae develop in the host abdomen during 9 days, the owner dies on the 8th day from the beginning of parasitism. Larva in the soil was 2 months, and then formed a puparium. Larvae emerge from the locust through the back of the abdomen, without damaging locust integument (Artamonov, 1988). Females lay their larvae, piercing intersegmental membrane of the host abdomen by sharp ovipositor (Léonide, 1967). This species is confined to meso- and xerophytic meadows, fallow, edges of clearing mesophytic forests (Verves & Khrokalo, 2006), steppes and deserts (Trofimov, 1969). Flies set on leaves of grasses, shrubs (Artamonov, 1988), stones and creaceous hills (Emden, 1954). Adults feed on aphids sugar liquid (Artamonov, 1985), flowers of *Euphorbia esula* (Séguy, 1941), *Pastanaca sativa*, *Seleranthus annuus* (Draber-Mońko, 1973) and were collected at altitudes up to 2400 m a. s. l. (Pekbey & Hayat, 2013a).

Material examined: Dnipropetrovsk Region: Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, bank of Samara River, meadow, at flowers of *Heracleum* sp., 5.08.2000, 6 ♂; feather grass steppe, 6-8.08.2000, 44 ♂ (Yu. Verves).

13. *Tephromyia grisea* (Meigen, 1826)

Distribution: Palaearctic: Europe: AL, AT, BG, BE, BY, CH, CZ (Moravia), DE, ES, FR (mainland), HU, IT (mainland and Sicily), MD, PL, RO, RS, RU (Bashkortostan, Rostov, Leningrad and Voronezh Regions), SI, SK, UA. Asia: AM, AZ, CN (Xinjiang), GE, JO, KZ, MN, RU (Altai, Novosibirsk and Primorye Regions), TR. UA: Cherkasy, Dnipropetrovsk, Donetsk, Kharkiv, Khmelnytsky, Kyiv, Poltava, Ternopil and Volyn Regions.

Larvae are internal parasites of nymphs and adults of *C. brunneus*, *C. jacobsi* (Tatsuta, 2002), *Chorthippus mollis*⁹ (Léonide & Léonide, 1986), *Dociostaurus maroccanus* (Paoli, 1919, 1939), *Oedipoda coerulescens* (Verves & Khrokalo, 2006). Flies were collected at altitudes up to 2100 m o. s. l. (Pekbey & Hayat, 2013a) at meso- and xerophytic meadows, steppe, clearings, tips of

⁹ in laboratory conditions

hills; feed at flowers, sometimes visit faeces, decaying meat, small corpses (Verves & Khrokalo, 2006).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 3.07.1988, 1 ♂ (S. Zrazhevsky).

Tribe *Sarcophagini*
Subtribe *Helicophagellina*

14. *Helicophagella* (s. str.) *agnata* (Rondani, 1860)

Distribution: Palaearctic: Europe: AL, AT, BE, BG, CH, CZ (Bohemia and Moravia), DE, DK, FI, FR (mainland and Corsica), HR, IT (mainland and Sicily), NL, NO, PL, RO, RS, RU (Karelia), SE, SK, ES, UA, UK (England). Asia: KZ. UA: Cherkasy, Chernigiv*, Chernivtsi, Ivano-Frankivsk, Kherson, Kyiv, Poltava and Zakarpattya Regions.

Larvae are necrophagous or pseudoparasitoids of terrestrial snail *Cantareus aspersus* (Coupland & Baker, 2004; Emden, 1954) and reared in the laboratory on freshly killed snails (Richet et al., 2011). This woodland species accompanying both deciduous and coniferous forests being clearly focused in montane beech woods (*Fagus*) at altitudes up to 1500 m a. s. l.; more distributed in little destroyed forested montane ranges (Povolný & Verves, 1990, 1997). In Sicily flies were collected in representative habitat of the meso-thermophilic association characteristics of North Sicily with annual precipitations between 600-900 mm on silicates. Its phytocenological characteristics is *Erico arboreae* - *Quercetum ilicis*: *Quercus* spp. + *Erica arborea*, etc (Povolný, 1999).

Material examined: Chernigiv Region: Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 6.08.1999, 1 ♂. Poltava Region: Pyryatyn District: environs of Grabarivka village, meadows near Ruda River, 15.07.2009, 1 ♂ (Yu. Verves).

15. *Helicophagella* (s. str.) *crassimargo* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AT, BA, BE, BG, CH, CZ (Bohemia and Moravia), DE, DK, ES, FI, FR (mainland), GR (mainland and Crete), HR, HU, IE, IT (mainland), LT, MD, MK, NL, NO, PL, RO, RS, RU (Karelia, Leningrad, Lipetsk, Moscow, Voronezh and Yaroslavl Regions), SE, SI, SK, UA, UK (England). Asia: AZ, GE, KG, KZ, RU (Altai, Kabardi-Balkaria), TR. UA: Cherkasy, Chernigiv, Chernivtsi, Ivano-Frankivsk, Kyiv, Odesa, Poltava, Volyn, Zakarpattya and Zhytomyr Regions.

Larvae are essentially copro- and necrophagous (Sychevskaya, 1965), prefer the small corpses (Blackith & Blackith, 1990), and bred from snail *Helicella virgata* (Keilin, 1919), but snails are not the normal breeding material for this fly (Blackith et al., 1994; Richet et al., 2011). This species shows a considerable hypsometric potency reaching elevations up to 2000 m a. s. l. It avoids forests preferring open landscape and dry habitats with poor vegetation including podzol soils; were collected in gardens and on flood markets too. Adults feed at flowering plants and are readily attracted to decaying organic substrates: faeces, excrement, cheese, small carcasses (Povolný & Verves, 1990, 1997).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 3.07.1988, 1 ♂ (S. Zrazhevsky). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 11.06. and 10.07.2000, 2 ♂. Kyiv City: Desna District: "Druzhby Narodiv" park, meadows nr Lake, 8.07.2005, 1 ♂; Holosiiv District: Baykove Cemetery, 13.07.2003, 2 ♂; "Didorovsky" pond, humid banks, 25.08.1999 and 12.09.2005, 2 ♂, 1 ♀; National Exhibition Centre, bushes, 27.08.1999, 3 ♂; Williams street, dry meadows, 28.07.2001 and 19.08.2002, 3 ♂; Obolon District: Verbne Lake, shores, 31.08.2004, 1 ♂; Shevchenko square, shores of Lakes, 27.09.2006, 2 ♂. Kyiv Region: Kyiv-Sviatoshyn District: 4 km N of Hostomel village, meadows at right bank of Irpin River, 8.07.2001, 3 ♂ (Yu. Verves).

16. *Helicophagella* (s. str.) *noverca* (Rondani, 1860)

Distribution: Palaearctic: Europe: BE, BG, CH, CZ (Bohemia and Moravia), DE, ES, FR (mainland), GR (mainland), HU, IT (mainland), MK, MNE, MT, NL, NO, PL, RO, RS, SK, SE, UA;

North Africa: EG; Asia: AZ, CY, GE, IL, RU (Karachay-Cherkessia), TR. UA: Chernivtsi, Crimea, Ivano-Frankivsk, Kyiv and Zakarpattya Regions.

Larvae develop in dead terrestrial snails *Helix pomatia* (Schmitz, 1910, 1917) and known as facultative parasitoids of living *Caucasotachea atrolabiata* (Coupland & Baker, 2004; Portsichinsky, 1887) and coprophagous; in laboratory conditions the maggots have been reared on horse meat (Eberhardt, 1955), dead snails and beef (Richet et al., 2011). Adults accompany the forest belt but frequent chiefly the warmer lower elevations (vegetation tiers), and are relatively rare in true mountain forests. Flies feed at flowers, and are readily attracted to decaying flech, faeces, excrement (Povolný & Verves, 1990, 1997), visiting flood markets (Aradi & Mihályi, 1971).

Material examined: Kyiv City: Podil District: "Syretz" residential community, park, humid meadow nr pond, 15.07.2005, 1 ♂. Zakarpattya Region: Uzhgorod District: Nyzhne Solotvyno village, tip of hill, beech forest, 98°33'N, 22°26'E, 200 m a. s. l., 18.08.2014, 2 ♂ (Yu. Verves).

17. *Helicophagella* (s. str.) *novercoides* (Böttcher, 1913)

Distribution: Palaearctic: Europe: AL, AT, BE, BG, CH, DE, ES, FR (mainland), GR (mainland), HR, HU, IT (mainland, Sardinia and Sicily), MNE, MT, RS, SK, UA; North Africa: EG; Asia: AZ, CY, IL, TR. UA: Chernivtsi and Crimea Regions.

This species reared in the laboratory on freshly killed snails (Richet et al., 2011). Imagoes are bioindicators of limestone biotopes at altitudes up to 1700 m o. s. l., particularly within forest limits (Povolný, 1999; Povolný et al., 1993).

Material examined: Crimea: Bakhchysaray District: Berego village, on rotten fruits, 18.08.2001, 2 ♂ (Yu. Verves).

18. *Helicophagella* (s. str.) *pseudagnata* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: UA; Asia: AM, AZ, GE, KG, RU (Chechnya, Dagestan and Kabardi-Balkaria Regions). UA: Crimea.

Flies prefer montanous bushes.

Material examined: Crimea: Alushta City: 9 km W, oak grove, 400 m a. s. l., 16.08.1976, 1 ♂ (Yu. Verves).

19. *Helicophagella* (s. str.) *rosellei* (Böttcher, 1913)

Distribution: Palaearctic: Europe: AT, BE, BG, CH, CZ (Bohemia and Moravia), DE, DK, ES, FR (mainland); HR, HU, IT (mainland and Sicily), MK, NL, NO, PL, RO, RS, RU (Karelia), SK, UA, UK (England); North Africa: EG; Asia: RU (Altai, Amur, Khabarovsk and Primorye Regions). UA: Chernivtsi, Ivano-Frankivsk, Kyiv and Zakarpattya Regions.

Larvae are bred from dead terrestrial snail (Hovemeyer, 1985) and reared in the laboratory on freshly killed snails (Richet et al., 2011). Flies accompany the forest belt, especially the natural mountain forests; they prefer dry areas and beech forests in Central Europe and occupied clearings exposed to the sun's rays (Povolný et al., 1993; Povolný & Verves, 1997) up to 2300 m a. s. l. in association *Caricion curvulae* (Menzel & Ziegler, 2002).

Material examined: Kyiv Region: Bila Tzerkva City: "Oleksandria" dendrological park, 3.05.2009, 2 ♂. Zakarpattya Region: Mizhgirrya District: 2-4 km S of Kolochava village, along stream Kvasovetz, 600 and 1000 m a. s. l., 12-13.08.1995, 2 ♂ (Yu. Verves).

20. *Helicophagella* (*Parabellieria*) *dreyfusi* Lehrer, 1994¹⁰

Distribution: Palaearctic: Europe: AL, MD, MK, RO, RU (Bashkortostan), UA; Asia: AF, AM, AZ, CN (Neimenggu, Ningxia, Xinjiang), GE, IL, IR, IQ, KG, KZ, MN, PA, RU (Alania, Buryatia, Chechnya, Chita, Dagestan and Ingushetia Regions), TJ, TR, TM, UZ. Oriental: PK (Baluchistan). UA: Crimea and Kherson Regions.

Larvae of this hemisynanthropic species are developed in faeces and fecal mass in lavatories and pork dung (Gadzhey, 1963; Ilyashenko, 1962). This species has also been reared as a facultative

¹⁰ This species had been not separated from *Helicophagella maculata* (Meigen, 1835) by all authors since Lehrer's publication (1994).

parasitoid from terrestrial gastropod *Theba pisana* (Coupland, 1994). Flies prefer steppes, deserts and cultural landscapes; absent in mountains (Sychevskaya, 1970; Trofimov, 1969).

Material examined: Crimea: Bakhchysaray District: Beregove village, flood market, 16.08.2001, 2 ♂ (Yu. Verves).

21. *Helicophagella (Parabellieria) macrura* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: BG, HU, SK, UA; Asia: KG, RU (Altai, Amur, Astrakhan, Karachay-Cherkessia, Khabarovsk, Magadan, Novosibirsk, Omsk, Primorye, Tyumen and Yakutia Regions). UA: Cherkasy, Kharkiv and Poltava Regions.

Larvae are developed in human faeces; 3rd stage larvae overwintering; adult flies feed at sugar substrates (Sychevskaya, 1978).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 30 km N of Kaniv, 9.07.1988, 1 ♂ (Yu. Verves).

22. *Helicophagella (Parabellieria) melanura* (Meigen, 1826)

Distribution: Nearctic: CA (British Columbia, Quebec), US (Massachusetts, New York, West Virginia). Palaearctic: Europe: AL, AT, BA, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland and Corsica), HU, IE, IT (mainland, Sardinia and Sicily), LT, LU, LV, MD, MK, MNE, MT, NL, NO, PL, PT, RO, RS, RU (Bashkortostan, Ivanovo, Karelia, Leningrad, Moscow, Murmansk, Pskov, Rostov and Voronezh Regions), SE, SI, SK, TR, UA, UK (England, Scotland, North IE); North Africa: DZ, EG, ES (Canary Is.), LY, MA, TN; Asia: AF, AM, AZ, CN (Anhui, Beijing, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shandong, Shanxi, Shaanxi, Shandong, Shanghai, Shanxi, Sichua, Tianjin, Xinjiang), CY, EG (Sinai), GE, IL, IR, IQ, JO, JP (Hokkaido, Honshu, Kyushu, Shikoku, Tsushima Is.), KG, KP, KR, KZ, LB, MN, PA, RU (Alania, Altai, Amur, Buryatia, Chechnya, Chita, Dagestan, Ingushetia, Kabardi-Balkaria, Kamchatka, Karachay-Cherkessia, Khabarovsk, Koryak, Krasnodar, Krasnoyarsk, Kurily Is., Magadan, Novosibirsk, Primorye, Sakhalin, Tomsk, Tyumen, Stavropol and Yakutia Regions), SY, Tibet, TJ, TM, TR, TW, UZ. Afrotropical: MR. Oriental: CN (all Provinces), IN (Bihar, Jammu and Kashmir, Tamil Nadu); JP (Ryukyu Is.), MY (West MY), PK, TW. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae mostly coprophagous (Rohdendorf, 1937, 1959; Sukhova, 1952; Trofimov, 1965, 1969; Zakharova, 1961, 1965); especially are developed in faeces and dung of cattle, fox, sheep and other mammals (Blackith et al., 1994; Martínez-Sánchez et al., 2000a, b; Olechowicz, 1976; Papp, 1985, 1995; Séguy, 1941; Skidmore, 1991), human faeces and latrine (Feng et al., 1990; Gadzhey, 1963; Stackelberg, 1956; Sychevskaya, 1960; Zakharova, 1961, 1965), occasionally in human corpses (Guo et al., 2011; Mohamed Aly & Wen, 2013; Mohamed Aly et al., 2012), different vertebrate animals (Anderson & VanLaerhoven, 1996; Rohdendorf, 1959; Stackelberg, 1956; Sukhova, 1952) and decaying meat (Artamonov, 1983). This species is known to breed in dog and fox faeces on light sandy soils and near paths much used by dogs, a medium likely to dehydrate quickly and in which the rapid development of a few larvae could be advantageous (Richet et al., 2011). Larvae are facultative predatory of other coprophilous maggots (Povolný et al., 1993). Hemisynanthropic culturophile species, preferring mesophytic phytocoenoses with shrubs (Aradi & Mihályi, 1971; Nandi, 2002; Rohdendorf, 1959). Maggots caused facultative traumatic tissue and occasional intestinal myiasis of humans, hedgehog, rats, rabbits (Chigusa et al., 1997; Emden, 1954; James, 1947; Nielsen et al., 1978; Rohdendorf, 1959); found also in nests of birds *Chelidon rustica* (Audsent, 1942; Séguy, 1930), bred from larvae of beetle *Oryctes nasicornis* (Emden, 1950), live and dead terrestrial snails *Arion hortensis* (Coupland & Baker, 2004; Keilin, 1919, 1921), *A. rufus* (Kühlhorn, 1986), *Cantareus aspersus* (Coupland & Baker, 2004; Keilin, 1919, 1921), and locust *Chorthippus brunneus* (Verves & Khrokalo, 2006). Flies feed at flowers, faeces, decomposed fruits (Draber-Moňko, 1973; Greenberg, 1971; Jędrzejewska-Szmek & Zych, 2013; Povolný & Verves, 1997; Prado e Castro et al., 2010; Verves, 2003), especially visit the small vertebrate corpses (Blackith & Blackith, 1990; Sukhova, 1952; Yang et al., 2010) and were collected at altitudes up to 3000 m a. s. l. (Feng, 2006). Adults are responsible for transfer of bacterial

disease and eggs of helminthes (Alakhverdiantz & Zakharova, 1961; Greenberg, 1971; Shura-Bura, 1952).

Material examined: Cherkasy Region: Cherkasy City: 28.05.1988, 1 ♂ (S. Zrazhevsky); Kaniv District: Kaniv State Nature Reserve, Krugly I., 10.06.1986, 1 ♀ (Yu. Verves); hombean forest, 2-19.08. 1988, 5 ♂ (S. Zrazhevsky); Zarichchya I., 30.07.1968, 1 ♂ (O. Viktorov-Nabokov); Zmiyini Is., coast of Kaniv Lake, 23.05.2003, 1 ♂; Uman City: "Sofiivka" dendrological park, 13-14.06.2006, 18 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 12.07. and 18-19.08.2000, 4 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest, 6.08.1999, 2 ♂. Crimea: Bakhchysaray District: Beregove village, sandy area, 1-11.08.2004, 5 ♂, 1 ♀; Lenino District: Qazan Tip State Reserve, 17-27.07.2007, 2 ♀. Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, bank of Samara River, dry meadows, at flowers of *Heracleum* sp., 4-11.08.2000, 2 ♂; 5.08.2000, 13 ♂; Fedorivka village, meadows along Samara River, 1.08.2000, 3 ♂. Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, sandy area, 26.07.1998, 1 ♂; Skadovsk District: Novo-Oleksiyivka village, near poultry farm, at horse and pig dung, 5.-6.09.1961, 2 ♀ (O. Viktorov-Nabokov). Kyiv City: Desna District: "Druzhby Narodiv" park, sandy coast and dry meadow, 1.07.2001 and 8.07.2005, 2 ♂; 5 km E of "Lisova" subway-station, mixed forest and bushes near Lisove Lake, 20.07.2004, 1 ♂, 7 ♀; Dnipro District: 2 km N of Moscow bridge, island on Dnipro, 30.05. and 29.08.2008, 9 ♂; Kozachy I. at Dnipro, 9.09.2009, 2 ♂; Rayduzny Massive, bushes on bank of Malynivka Lake, 23.06.2005, 2 ♂; Holiiv District: "Didorovsky" pond, humid banks, 25.08-4.09.1999, 11.07-9.08.2002, ♀; 28.06.2004, 12.09.2005, 42 ♂, 4 ♀; Kozacha street, wall of byilding, 7.07.2005, 1 ♂; Olzhyn I. at Dnipro, 10 km S of Kharkiv bridge, 8.07.2009, 1 ♂; "Sovky hole", coast of pond, humid meadow, 10.09.2000, 30.07.29.08.2002, 27.06.-1.08.2003, 27.08.2004, 11.07.2005 and 9.06.2011, 55 ♂, 3 ♀ (Yu. Verves); Uralska street, 3-6.07.2009, 2 ♀ (A. Drozdovska); Vasylkivska street 98, yard, 9.05. and 12.07.2002, 2 ♂; Williams street, dry meadows, 10-28.07.2001 and 12-19.08.2002, 14 ♂, 1 ♀; Zhukiv I. at Dnipro, 20 km S of Kyiv, 9.09.2002, 2 ♂, 1 ♀; Obolon District: island at Dnipro, N 50°30'25", E 30°31'16", 26.05., 16.06. and 22.09.2011, 24 ♂, 1 ♀; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000, 15.07.2005, 4 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 27.08.2003, 1 ♂. Kyiv Region: Boryspil District: Rozhny village, bushes at coast of Dnipro, 15-22.08.1999, 19 ♂, 1 ♀; Brovary District: Zazymya village, meadows, 1.08.2001, 2 ♂; Kyiv-Sviatoslyn District: 4 km N of Hostomel village, meadows at right bank of Irpin River, 8.07.2001, 1 ♂; 2-4 km E of Irpin City, forest nr bog, 26.04.2003, 1 ♂; 10 km S of Kyiv, Kruglyk village, meadow nr pond, 30.04.2000, 1 ♂; Moshchun village, humid meadows near forest stream, 8.09.2003, 1 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 15.06.2004, 1 ♂; Obukhiv District: Velyki Dmytrovychi village, grass coast of stream and asp forest nr bog, 8.09.1995 and 4.07.1999, 3 ♂; Ukrainka City, dry meadow and bushes, 14.09.2003 and 21.08.2004, 3 ♂; Rokytno District: Busheve village, N 49°39', E 30°35', open cast, 27.07.2012, 9 ♂, 3 ♀; Vyshgorod District: Osischyna village, meadows, 3.06.2007, 4 ♂, 1 ♀ (Yu. Verves). Luhansk Region: Stanychno-Luhanska District: Nova Kindrashivka village, sandy area, 1.08.2008, 1 ♂; Sverdlovsk District: Provallya village, 27-29.07.2008, 1 ♂ (A. Drozdovska). Mykolaiv Region: Ochakiv District: Kinburn sandy area, 16.05.2003, 1 ♂ (Yu. Protzenko); Parutino village, debris of antic City Olvia, 16.07.2006, 2 ♂, 2 ♀ (Yu. Verves). Poltava Region: Pyryatyn District: Bilotzerkivtzi village, "Murentzeve" locality, 15.08.2010, 1 ♂ (O. Tkachenko); Davydivka village, meadows, 15.07.2009, 3 ♂; Grabarivka village, meadows near Ruda River, 15.07.2009, 1 ♂; Keybalivka village, meadows at bank of Uday River, 18.08.2010, 1 ♂; Kharkivtzy village, "Velyki Solontzi" locality", 13-14.07.09, 1 ♂, 3 ♀ (Yu. Verves), Lelyaky village, 21.7.2005, 1 ♀; Mala Krucha village, 11-13.07.08, 1 ♂ (A. Drozdovska); Masalske village, meadows at bank of Uday River, 14.08.2010, 1 ♀ (Yu. Verves); Povstyn village, locality "Burty", meadows, 12.07.2009, 1 ♂ (V. Gorobchyslyn); Usivka village, meadows, 10. and 16.07.2009, 2 ♂ (Yu. Verves). Sumy Region: Sumy District: Vakolovshchyna village, bog, 5-14.06.2007, 1 ♂ (O. Govorun); Romny City: banks of Romenka River, meadows and bushes, 21-30.08.2009, 26 ♂. Zakarpattia Region: Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140 m a. s. l., 16-20.08.2014, 1 ♂. Zaporizzhya Region: Berdyansk City, sandy spit at Azov Sea, 14-17.08.1994, 6 ♂, 2 ♀; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 10-27.08.1997, 39 ♂, 1 ♀; Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, meadows and

bushes, 23.08.1997 and 15.06.2008, 7♂; Kyrylivka village, Fedotova kosa, sandy area nr sea coast, 16-17.08.1997, 4 ♂, 2 ♀ (Yu. Verves).

Subtribe Heteronychiina

23. *Discachaeta arcipes* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AT, BE, BG, CH, CZ (Bohemia and Moravia), DE, ES, FR (mainland), HR, HU, IT (mainland), NL, PL, RO, RS, SK, UA, UK (England). UA: Ternopil Region.

Larvae parasitize terrestrial gastropods *Euomphalia strigella* (Povolný & Groschafft, 1959), *Helicella itala* (Rudzinski, 1995), *Xerolenta obvia* (Verves & Kuzmovich, 1979). Flies prefer chalk deposits (Emden, 1954; Rudzinski & Flügel, 2007), and feed on flowering *Daucus carota*, *Euphorbia esula*, *Peucedanum oreoselinum*, *Prunus padus*, *Seleranthus* sp., *Thymus serpyllum*, *Tilia cordata*, and on oak leaves on honeydew of *Tuberculoides annulatus* (Draber-Mońko, 1973).

24. *Discachaeta cucullans* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AT, BA, BG, CH, CZ (Bohemia and Moravia), DE, ES, FR (mainland), GR, HR, HU, IT (mainland and Sicily), RO, RS, SK, UA; Asia: AM, AZ, GE, IL, RU (Dagestan), TR. UA: Crimea, Kherson, Mykolaiv and Zaporizzhya Regions.

Larvae are the parasitoids of terrestrial snails *Cernuella virgata* (Hopkins & Baker, 1993; Lehrer, 1966), *Euomphalia strigella*, *Helicella obvia* (Povolný & Verves, 1990), *Theba pisana* (Hopkins & Baker, 1993; Lehrer, 1966). Adults prefer chalk deposits (Emden, 1954), steppes and deserts (Trofimov, 1969), different limestone and dolomite-limestone thermophilic associations from the sea coast to more than 1600 m a. s. l. (Povolný, 1999).

Material examined: Crimea: Bakhchysaray District: Beregove village, sandy area, 3-10.08.2004, 9 ♂, 11 ♀; Lenino District: Qazan Tip State Reserve, 10-13.05.2005, 19-27.07.2007, 15 ♂, 4 ♀ (L. Khrokalo, Yu. Verves). Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, sandy and dry steppe areas, 8.07.1998, 1 ♂. Zaporizzhya Region: Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 12.06.2008, 1 ♂ (Yu. Verves).

25. *Discachaeta pumila* (Meigen, 1826)

Distribution: Palaearctic: Europe: AT, BE, BG, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland), HR, HU, IT (mainland), LV, LT, NL, NO, PL, RO, RU (Kaliningrad, Moscow and Leningrad Regions), SE, SK, UA, UK (England). Asia: IL. UA: Ivano-Frankivsk, Khmelnytsky, Kyiv and Ternopil Regions.

Larvae are endoparasites of terrestrial crop-damaging snail *Theba pisana* (Harpaz & Oseri, 1961; Moran, 1987) and reared in the laboratory on freshly killed flies. Imagoes prefer lower, damper areas with very few caught on the limestone ridge (Richet et al., 2011); associated with chalk deposits and wastelands (Emden, 1954; Kejval, 1998) at altitudes up to 1650 m a. s. l.; feed on flowers of *Heracleum* sp. (Menzel & Ziegler, 2002), *Achillea millefolium* (Draber-Mońko, 1973), and *Daucus* sp. (Richet et al., 2011).

Material examined: Ivano-Frankivsk Region: Kosiv District: Rozhniv village, humid meadow, 8-11.08.1975, 4 ♂; Kyiv City: Hosiiv District: Baykove Cementery, 13.07.-24.09.2003, 6 ♂; Hosiiv Park in memory M. Rylsky, 10.06.2009, 1 ♂; "Sovky hole", coast of pond, humid meadow, 16.07.2003, 5 ♂, 2 ♀ (Yu. Verves); Uralska street, 6.07.2009, 1 ♂ (A. Drozdovska); Vasylykivska street 33, yard, 5.07.2008, 21.06.2010, 27.05., 29.06. and 7.07.2010, 8 ♂, 2 ♀; Vasylykivska street 98, yard, 19.07. and 8.08.2002, 2 ♂, 1 ♀ (a pair collected *in copula*); Williams street, dry meadows, 19.08.2002, 1 ♂; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000, 15.07.2005, 2 ♂ (Yu. Verves).

26. *Heteronychia (Boettcherella) mutila* (Villeneuve, 1912)

Distribution: Palaearctic: Europe: BG, GR, HR, HU, RO, RS, SK, UA. Asia: AM, CY, GE, RU (Krasnodar Region), TR. UA: Crimea, Kherson, Mykolaiv, Odesa and Zaporizzhya Regions.

Larvae are the parasitoids of terrestrial *Helicidae* (Coupland & Baker, 2004). The species accompanies rather undisturbed xerothermophilous habitats, especially on limestone with forest-steppe or open steppe vegetation (Povolný & Verves, 1997).

Material examined: Crimea: Bakhchysaray District: Beregove village, sandy area, 4-5.08.2004, 2 ♂; Lenino District: Qazan Tip State Reserve, 10-13.05.2005, 1 ♂ (L. Khrokalo, Yu. Verves). Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, sandy and dry steppe areas, 7-8., 14.-16. and 24.07.1998, 79 ♂, 1 ♀. Zaporizzhya Region: Berdyansk City, sandy spit at Azov Sea, 14-17.08.1994, 48 ♂, 11 ♀; Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, meadows and bushes, 23.08.1997, 4. and 13.06.2008, 4 ♂; Kyrylivka village, Fedotova kosa, sandy area nr sea coast, 16.08.1997, 38 ♂, 14 ♀ (Yu. Verves).

27. *Heteronychia (Ctenodasypygia) siciliensis* (Böttcher, 1913)

Distribution: Palaearctic: Europe: BG, ES, GR, HU, IT (mainland and Sicily), RO, UA; North Africa: EG, ES (Canary Is.); Asia: CY, IL, PA, SY, TR. UA: Crimea and Odesa* Regions.

Larvae are parasitoids of terrestrial snails. Flies prefer hot and very dry habitats (e. g. stony riverbeds in *Juglando-Platanetum orientalis*); adults usually sit in shady places under trees and shrubs (Povolný, 1992, 1998).

Material examined: Crimea: Bakhchisaray District: Beregove village, sandy area and sea shore, 11.08.1996, 15-25.08.2001 and 4-9.08.2004, 21 ♂, 2 ♀; Lenino District: Qazan Tip State Reserve, 17-29.07.2007, 23 ♂, 59 ♀ (Yu. Verves). Odesa City: Hydrobiological station of University, 26.08.2009, 1 ♂, 1 ♀ (Yu. Protzenko).

28. *Heteronychia* (s. str.) *belanowskyi* Verves, 1973

Distribution: Palaearctic: Europe: BG, CZ (Moravia), GR, HU, RO, RS, RU (Voronezh Region), SK, UA; Asia: AZ, GE, RU (North Caucasus). UA: Crimea, Dnipropetrovsk, Kherson, Kyiv, Mykolaiv, Odesa and Zaporizzhya Regions.

This is a thermophilic and obviously heliophilic species accompanying forest-steppe and steppe habitats. In mountains it occurs in habitats with thin vegetation of shrubs, preferring dry soils - limestone habitats, loess (Povolný & Verves, 1997).

Material examined: Crimea: Bakhchysaray District: Beregove village, sea shores, 25.08.2001, 1 ♂; sandy area, 6-9.08.2004, 3 ♂ (Yu. Verves); Lenino District: Qazan Tip State Reserve, 10-13.05.2005, 5 ♂, 5 ♀ (L. Khrokalo, A. Kotenko). Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, feather grass steppe, 6. and 10.08.2000, 7 ♂. Kherson Region: Chapline District: Askania-Nova Biosphere Reserve, park, 22-28.07.2008, 62 ♂; Gola Prystan District: Black Sea Biosphere Reserve, Ivano-Rybalchansky branch, 10.08.1974, 4 ♂. Kyiv City: Shevchenko District: O. Fomin Botany Garden, 25.05.2002, 1 ♂ (Yu. Verves). Mykolaiv Region: Berezanka District, coast of Tiligul lyman, 15-20.06.1988, 3 ♀ (S. Zrazhevsky). Odesa Region: Ismail District: Ismail City, 8.08.2009, 1 ♂; Suvorove village, 21.05., 12.08.2003 and 21.08.2009, 3 ♂ (V. Corobchyshyn, Yu. Protzenko); Ivanivka District: Severynivka village, forest, 25.07.1985, 1 ♂; Zaporizzhya Region: Berdyansk City, park, 2.-26.05.1966 and 5.07.1974, 5 ♂, 2 ♀ (N. Gulinov); Melitopol City, 6. & 2 6.06.1981, 5.06.1983, 5 ♂ (S. Dzharov, I. Vlasov).

29. *Heteronychia* (s. str.) *bulgarica* (Enderlein, 1936)

Distribution: Europe: AT, BG, BY, DE, CH, CZ (Bohemia and Moravia), DK, EE, ES, FR (mainland and Corsica), HR, HU, IT (mainland, Sardinia and Sicily), MD, MT, NO, PL, PT, RO, RU (Bashkortostan, Leningrad and Perm Regions), SE, SK, UA; Asia: AM, AZ, GE, RU (Kabardi-Balkaria and Karachay-Cherkessia), TR. UA: Cherkasy, Donetsk, Kharkiv, Kyiv, Luhansk, Poltava, Volyn and Zhytomyr Regions.

This species bred from a live terrestrial snail. Flies accompany warm and thin lowground forests and river valleys including the lower vegetation tiers (Povolný & Verves, 1990, 1997); feed on flowers of *Anethum graveolens* (Verves, 2003).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 30 km N of Kaniv, 20.06.1983, 9.07.1988, 6 ♂ (Yu. Verves, S. Zrazhevsky). Kyiv City: Holosiiv District: Baykove Cemetery, 7.08. and 24.09.2003, 3 ♂; "Didorovsky" pond, humid banks, 28.08.1999, 1 ♂; Vasylykivska street 33, yard, 25.06.2008 and 18.-28.07.2009, 5 ♂, 1 ♀; Vasylykivska street 98, yard, 22.07.2002, 2 ♂; Williams street, dry meadows, 19.08.2002, 1 ♂ (Yu. Verves); Podil District: Vyshgorod street, Station of Young Naturalists, park, 19, 21. and 31.07.1959, 4 ♂ (O. Rogocha). Kyiv Region: Kyiv-Sviatoshyn District: Moshchun village, humid meadows near forest stream, 8.09.2003, 2 ♂; Obukhiv District: Velyki Dmytrovychi village, dry meadows, 29.06.2001, 1 ♂ (Yu. Verves). Poltava Region: Pyryatyn District: Lelyaky village, bank of Uday river, 28.05.2013, 1 ♂ (Yu. Protzenko)

30. *Heteronychia (s. str.) chaetoneura* Brauer and Bergenstamm, 1889*

Distribution: Palaearctic: Europe: AT, DE, FR (mainland), UA: Chernigiv, Kherson, Kyiv City and Kyiv Regions. Firstly recorded for Ukrainian fauna.

Material examined: Chernigiv Region: Borzna District: environs of Yaduty village, Biological Station of Nizhyn University, 51°, 24,3' N, 32°, 22,6' E, bog, 11.06.-11.07.2000, 9 ♂. Kherson Region: Gola Prystan City, bog, 30.08.1974, 6 ♂. Kyiv Region: Brovary District, Rozhny village, bog, 15.08.1999, 2 ♂ (Yu. Verves).

31. *Heteronychia (s. str.) consanguinea* (Rondani, 1860)

Distribution: Palaearctic: Europe: BG, FR (mainland and Corsica), GR, HR, IT (mainland, Sardinia and Sicily), RS, RU (Krasnodar and Stavropol Regions), UA; North Africa: DZ; Asia: IL, PA, SY, TR. Oriental: PK (North-West Frontier Province). UA: Chernivtzi and Crimea Regions.

Larvae are parasitoids of terrestrial snail *Theba pisana* (Coupland, 1994). In Sicily flies were collected at altitudes to 800 m o. s. l., in thermophilic associations on limestone with secondary macchia, but essentially being *Pistacio-Rhamnetalia alaterni*, *Pistacio lentisci-Quercetanea ilicis*, *Oleo-Quercetanea virgilianae* and *Erico arboreae-Quercetanea ilicis*; from the branches of *Quercus ilex*; at the tips of dry stems of *Asphodellus ramosus* etc. (Povolný, 2003; Povolný & Znojil, 1999).

Material examined: Crimea: Lenino District: Qazan Tip State Reserve, 17-29.07.2007, at coastal sea stones, 10 ♂, 10 ♀ (Yu. Verves).

32. *Heteronychia (s. str.) depressifrons* (Zetterstedt, 1845)

Distribution: Palaearctic: AL, AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland), GR (Corfu I.), HR, HU, IT (mainland), MK, MT, NL, NO, PL, RO, RS, RU (Ivanovo, Moscow, Leningrad and Voronezh Regions), SE, SK, UA, UK; Asia: CN (Beijing, Jiangsu, Liaoning, Shanghai), JP (Kyushu), KN, OM, RU (Karachay-Cherkessia, Novosibirsk, Southern Primorye and Tomsk Regions). Oriental: CN (Guizhou), JP (Ryukyu Is.: Okinawa I.). UA: Cherkasy, Chernigiv, Chernivtsi, Dnipropetrovsk, Ivano-Frankivsk, Kirovograd, Kharkiv, Kyiv, Poltava, Volyn, Zakarpattya and Zhytomyr Regions.

This forest species prefers shady humid stands at lower forest elevations (Povolný & Verves, 1997); reared in the laboratory on freshly killed snails (Richet et al., 2011). Flies feed on flowers and aphid excreta (Verves & Khrokalo, 2006). In mountains adults were collected at altitude 1400 m a. s. l. in association *Adenostylo-Piceetum* on flowers of *Heracleum* (Menzel & Ziegler, 2002).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, side of hill "Maryina Gora", humid hornbeam forest, 3.06.2003, 1 ♂. Kyiv City: Holosiiv District: "Sovky hole", coast of pond, humid meadow, 31.07.2002, 1 ♂, 1 ♀. Kyiv Region: Bila Tzerkva City, "Oleksandria" dendrological park, 3.05.2009, 1 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 29.05. and 4.06.2003, 6 ♂, 3 ♀; 5.07.2007, 1 ♂ (Yu. Verves). Poltava Region: Pyryatyn District: Krotky village, 8.07.2008, 1 ♀ (A. Drozdovska). Zakarpattya Region: Uzhgorod District: Nyzhne Solotvyno village, humid meadow nr stream, 98°33'N, 22°26'E, 160 m a. s. l., 21.08.2014, 1 ♀ (Yu. Verves).

33. *Heteronychia (s. str.) dissimilis* (Meigen, 1826)

Distribution: Palaearctic: AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, EE, ES, FR (mainland), HR, HU, IT (mainland), LT, LV, MD, MK, NL, PL, RO, RS, RU (Arkhangelsk, Kaliningrad, Leningrad, Moscow and Voronezh Regions), SK, UA, UK (England); Asia: CY, RU (Primorye, Sakhalin and Tyumen Regions). UA: Cherkasy, Chernigiv, Chernivtsi, Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Luhans'k, Mykolaiv, Poltava, Rivne, Sumy*, Ternopil, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are developed in terrestrial succineid snails (Verves, 1976) and helioid snails *Arianta arbustorum*, *Brachybaena fruticum*, *Monachoides incarnata* (Verves & Khrokalo, 2006); reared in the laboratory on freshly killed snails (Richet et al., 2011). Flies prefer bags, humid meadows, borders of hygrophylous forests and alp meadows. Adults feed on flowers and aphid excreta (Verves & Khrokalo, 2006).

Material examined: Cherkasy Region: Cherkasy District: Khreschatyk village, humid meadow, at *Vicia crassa*, 20.08.1946, 1 ♂; Sushky village, humid meadows, 16.07.1946, 1 ♂; Kaniv District: Polstyn village, bog, 8.07.1947, 1 ♂ (O. Kryshthal); Kaniv State Nature Reserve, bogs and bushes nr Dnipro River, 22.05-20.09, 1966-1969, 1972-1991, 2003-2004, 2010, 185 ♂ 11 ♀, (Yu. Verves); Zmiini Is., bushes at coast of Dnipro, 23.06.1988, 1 ♂ (S. Zrazhewsky). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 51°24,3' N, 32°, 22,6' E, 11.06.-25.08.2000, 17 ♂, 6 ♀ (Yu. Verves). Kyiv City: Holosiiv District: "Sovky hole", coast of pond, humid meadow, 10.09.2000, 27.06. and 16.07.2003, 6 ♂, 2 ♀; Obolon district: unnamed island at Dnipro, N 50°30'25", E 30°31'16", 26.05.2011, 3 ♂; 10 km S of Kyiv City Centre, Olzhyn I. at Dnipro, 25.06.2009, 1 ♀; Podil District: Shevchenko Underground Station, humid meadow nr pond, 3-4.06.2000, 1 ♂; Shevchenko District: "Syretz" residential community, park, humid meadow nr pond, 3-4.06.2000, 3 ♂; Kyiv Region: Boryspil District: Rozhny village, bushes at Dnipro coast, 22.08.1999, 2 ♂, 1 ♀; Brovary District: Zazymya village, 5 km N, 1.08.2001, 50 ♂, 3 ♀; Obukhiv District: Velyki Dmytrovychi village, asp forest nr bog, 4.07.1994, 4.07.1999, 9 ♂, 2 ♀ (Yu. Verves). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13 and 15.08.2010, 2 ♀; Ulyanivka village, meadows, 13.07.2009, 2 ♂ (Yu. Verves); Kremenchug District: Samusivka Village, bog, 21. and 25.06.1949, 3 ♂ (O. Kryshthal); Pyryatyn District: Grabarivka village, meadows near Ruda river, 15.07.2009, 3 ♂; Bilotzerkivtzi village, locality "Murentzeve", 15.08.2010, 1 ♀; Keybalivka village, meadows at bank of Uday river, 11-17.07.2009, 4 ♀; Kharkivtzy village, 2 km S, "Velyki Solontzi" locality, 13-14.07.09, 1 ♀; Lelyaky village, meadows at bank of Uday river, 12. & 16.08.2010, 1 ♂ 2 ♀; Shkuraty village, meadows, 17.07.2009, 1 ♀; Usivka village, meadows, 10 and 16.07.2009, 2 ♂ (A. Drozdovska, O. Tkachenko, Yu. Verves); Semeniv District: estuary of Sula River, humid meadows, 21.06.1949, 2 ♂ (O. Kryshthal); Sumy Region: Romny City, banks of Romenka River, meadows and bushes, 21-30.08.2009, 2 ♂, 2 ♀ (Yu. Verves); Sumy District: Vakolovschyna Village, dry meadow, 17.06.1992, 1 ♀ (V. Gorobchysyn); Mogrytzya Village, 7-9.08.2009, 1 ♂ (Yu. Protzenko); Zakarpattia Region: Mizhgyria District: Kolochava village, 3-12.08.1995, 4 ♂, 1 ♀ (Yu. Verves); Zhytomyr Region: Novograd-Volynskiy City, bank of River, 17.07.1979, 1 ♂ (V. Korneev).

34. *Heteronychia (s. str.) haemorrhoea* (Meigen, 1826)

Distribution: Palaearctic: Europe: AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland and Corsica), GR, HR, HU, IE, IT (mainland, Sardinia and Sicily), LV, MK, NO, PL, RO, RS, RU (Bashkortostan, Leningrad and Voronezh Regions), SE, SK, UA, UK (England); Asia: AZ, TR. UA: Cherkasy, Chernigiv, Chernivtsi, Krymea, Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Kyiv, Mykolaiv, Odesa, Sumy* and Zakarpattia Regions.

Larvae bred from living snails *Cepaea hortensis* (Keilin, 1919; Mik, 1890; Schmitz, 1917), *C. nemoralis* (Enderlein, 1933) and *C. vindobonensis* (firstly recorded). Adults associated with limestone territories or lowland flood-plain forests (Girfanova, 1958; Gunárová & Slamečková, 1966; Kejval, 1998). Flying period is continued from May to October (Séguy, 1941); the flies feed on flowers of *Anethum graveolens*, *Heracleum sibiricum*, *Solidago canadensis* (Verves, 2003, 2013).

Material examined: Cherkasy Region: Uman City, "Sofiivka" dendrological park, 13-14.06.2006, 2 ♂, 2 ♀; Kaniv District: Buchak village, 6.07.1983, 2 ♂; Kaniv Nature Reserve, 23.06.

and 4.07.1983, 11 ♂; Keleberda village, 3 km E, humid forest near pond, 20.05.2002, 1 ♂; Ros River, mouth, humid meadow, 24.07.1979, 3 ♂; Trakhtemyriv Village, 9.-12.07.1983, 3 ♂, 3 ♀ (one pair in copula); 06.1983, 1 ♂, bred from living terrestrial snail *Cepaea vindobonensis*. Chernigiv Region: Ichnya district: “Trostyanetz” dendrological park, meadows and forest at lake coast, 4. and 11.08.1999, 4 ♂, 1 ♀; Kirovograd Region: Znyamyanka District: “Chorny Lis” forest, 25.07.1960, 1 ♂, at flowers of *Aegopodium podagraria* (L. Rogocha). Kyiv City: Dnipro District: Hydropark, bushes, 16.06.2010, 1 ♂, 5 ♀; Trukhaniv I., nr Babyne lake, 12.08.2007, 1 ♀; Holosiiv District: Baykove Cemetery, 13.07.-7.08.2003, 26 ♂, 9 ♀, 16.08.2004, 15 ♂, 1 ♀; “Didorovsky” pond, humid banks, 25.08.1999, 11.07-9.08.2002, 19 ♂, 2 ♀; Kozacha street, on leaves, 7.07.2005, 1 ♂; National Exhibition Centre, bushes, 27.08.1999, 17 ♂; “Sovky hole”, coast of pond, humid meadow, 30.07.-29.08.2002, 27.06.-16.07.2003, 27.08.2004, 88 ♂, 7 ♀; “Theophania” park, bushes, 11.06.2013, 4 ♂; Vasylykivska street 33, yard, 27.05.2010, 1 ♂; Vasylykivska street 98, yard, 5.05.-30.09.2002, 31 ♂, 12 ♀; Williams street, dry meadows, 25.04.-19.08.2002, 17 ♂, 1 ♀; Podil District: Hydropark, bushes, 16.06.2010, 1 ♂; Shevchenko Square, humid meadow nr pond, 3-4.06.2000, 1 ♂; “Syretz” residential community, park, humid meadow nr pond, 3-4.06.2000, 1 ♂; Trukhaniv I., nr Babyne lake, 12.08.2007, 1 ♀ (Yu. Verves); Vyshgorod street, Station of Young Naturalists, ravine, 28. & 31.07, 5. & 15.08.1959, 7 ♂, at flowers of *Heracleum* sp. (O. Rogocha); Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 12 ♂, 3 ♀; (Yu. Verves). Kyiv Region: Kyiv-Svyatoshyn District: Kruglyk village, bushes nr stream, 24.05. and 31.07.1972, 13 ♂; “Zhukiv Khutir” locality, humid forest, 14.07-14.08.1972, 15 ♂, 2 ♀; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 15.06.2004, 1 ♂; Obukhiv District: Tatzenky village, 3 km S, 14.09.2003, at leaves and ground at border of pine forest nr lake, 4 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 15.06.2004, 1 ♂; Tarascha District: Severynivka village, 25.07.1985, 1 ♂; Vyshgorod District: 20 km N of dam, left coast of Kyiv reservoir, sandy area and bushes, 5.8.2001, 3 ♂ (Yu. Verves). Odesa Region: Ismail District, Maly Taman I., 15. 07.2003, 1 ♂ (Yu. Protzenko); Odesa City, humid bushes near sea, 15.-26.08.1979, 3 ♂, 3 ♀. Poltava Region: Pyryatyn District: Shkuraty village, locality “Ostriv”, sandy road, 15.08.2010, 1 ♂, 1 ♀ (Yu. Verves). Sumy Region: Romny City, banks of Romenka river, meadows and bushes, 21-27.08.2009, 2 ♂; dry meadows, at flowers of *Taraxacum officinale*, 5.05.2013, 1 ♂ (Yu. Verves).

35. *Heteronychia (s. str.) haemorrhoides* (Böttcher, 1913)

Distribution: Palaearctic: Europe: AT, BG, BY, CZ (Moravia), DE, EE, GR, HR, HU, IT (mainland), MD, MK, MT, PL, RU (Bashkortostan, Karelia, Leningrad, Perm and Voronezh Regions), UA; Asia: AZ, AM, GE, IL, IR, PA, RU (Alania, Altai, Dagestan, Karachay-Cherkessia, Krasnodar, Krasnoyarsk and Perm Regions), SY, TR. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are parasitoids of various *Helicidae*: *Cantareus aspersus*, *Cepaea nemoralis*, *Eobania vermiculata*. Adult flies occupy warm forest and shrubland habitats (Berner, 1973; Coupland & Baker, 2004; Povolný, 1992; Povolný & Verves, 1990). Flies were collected on stones at sea shore (Drensky, 1957); feed on flowers of *Pimpinella saxifraga* (Girfanova, 1958) and *Carum carvi* (Verves, 1979).

Material examined: Chernigiv Region: Ichnya District: “Trostyanetz” dendrological park, meadows and forest at lake coast, 5-11.08.1999, 14 ♂, 1 ♀ (Yu. Verves). Crimea: Bakhchisaray District: Beregove village, sandy area, 6.08.2004, 1 ♂; Lenino District: Qazan Tip State Reserve, 24 and 29.07.2007, 2 ♂ (Yu. Verves); Theodosia Municipal Government: Karadagh Natural Reserve, 2-5.07.2006, 2 ♂ (A. Drozdovska). Kyiv City: Holosiiv District: Baykove Cemetery, 7.08.2003, 10 ♂; Dykiy island at Dnipro, sandy area, N 50°17'02", E 30°39'22" 6.10.2011, 1 ♀; Vasylykivska street 33, yard, 26.06.2009, 1 ♂. Kyiv Region: Kyiv-Svyatoshyn District: Irpin City, 2-4 km E, forest nr bog, 26.04.2003, 3 ♂ (Yu. Verves). Mykolaiv Region: Berezanka District: Tiligul lyman, coast, 4-20.07.1987, 15.06.1988, 1 ♂ (S. Zrazhewsky); Ochakiv District: Kinburn sandy area, 16.05.2003, 1 ♂ (Yu. Protzenko). Poltava Region: Pyryatyn District: Grabarivka village, meadows near Ruda river, 15.07.2009, 5 ♂, 6 ♀. Sumy Region: Romny City, banks of Romenka river, meadows and bushes, 21-

27.08.2009, 1 ♂. Zaporizzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 123 ♂, 8 ♀ (Yu. Verves).

36. *Heteronychia (s. str.) lacrymans* (Villeneuve, 1912)

Distribution: Palaearctic: Europe: AT, BG, CZ (Bohemia and Moravia), HU, RO, SK, UA; Asia: GE, IL, IQ, RU (Krasnodar Region), TR. UA: Crimea, Dnipropetrovsk, Kherson, Kyiv and Zaporizzhya Regions.

This species is an indicator of native biotopes in Carpathian mountain forests (Povolný, 1985).

Material examined: Crimea: Alushta City: 15 km NE, environs of Rybacha village, hollow “Kanakskaya Balka”, meadows, 5-8.05.2005, 1 ♂, 2 ♀; Bakhchisaray District: Beregoe village, sandy area, 6-8.08.2004, 9 ♂; Lenino District: Qazan Tip State Reserve, 17-28.07.2007, 2 ♂, 2 ♀ (L. Khrokalo, Yu. Verves).

37. *Heteronychia (s. str.) mazurmovitshi* Verves, 1977

Distribution: Palaearctic: Europe: UA: Cherkasy, Poltava* and Vinnytsia* Regions.

Material examined: Poltava Region: Grebinky District: environs of Kulazhyntzy village, meadows, 13 and 15.08.2010, 1 ♂; Pyryatyn District: Davydivka village, meadows, 15.07.2009, 2 ♂; Keybalivka village, meadows near Uday river, 11.07.2009, 2 ♂; Usivka village, meadows, 10 & 16.07.2009, 2 ♂ (A. Drozdovska, Yu. Verves). Vinnytsia Region: Chechelnyk District: “Karmelyuk's Podillya” National Nature Park, Dokhno village, 8.07.2013, (V. Gorobchysyn).

38. *Heteronychia (s. str.) pauciseta* (Pandellé, 1896)

Distribution: Palaearctic: Europe: BA, BG, CH, CZ (Bohemia and Moravia), DE, EE, GR, HR, PL, RS, RU (Bashkortostan, Kaliningrad, Leningrad, Moscow and Perm Regions), SK, UA; Asia: RU (Altai, Irkutsk and Tuva Regions). UA: Kharkiv Region.

Forest species accompanying mesophytic formations (Povolný & Verves, 1997).

39. *Heteronychia (s. str.) proxima* (Rondani, 1860)

Distribution: Palaearctic: Europe: AD, AL, AT, BG, BY, CH, CZ (Bohemia and Moravia), DE, EE, ES, FI, HR, HU, IT (mainland and Sicily), LV, MD, PL, RO, RS, RU (Ivanovo, Leningrad, Lipetzk, Moscow, Voronezh and Yaroslavl Regions), SK, SE, UA; North Africa: LY (Bezzi, 1921¹¹); Asia: RU (Altai and Novosibirsk Regions), CN (Xinjiang). UA: Cherkasy, Chernigiv, Chernivtsi, Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Kirovograd, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Sumy*, Vinnytsia, Volyn, Zakarpattia, Zaporizzhya and Zhytomyr Regions.

Larvae are endoparasites of terrestrial snail *Eumphalia strigella* (Povolný & Groschaft, 1959) and caterpillar of geometrid moth, *Agriopis aurantaria* (firstly recorded). Flies are common on meadows, forests borders (Gunárová & Slamečková, 1966; Verves, 1973), chalk grasslands and limestone hillsides (Rudzinski & Flügel, 2007). Adults feed at flowers of *Phalacrolooma annuus*, *P. septentrionale*, *Solidago canadensis* (Verves, 2013).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, Krugly I., 20.07.1986, 1 ♀; yard, at vegetation, 19.08.1988, 1 ♂; 8.06.2003, 3 ♂; side of hill “Maryina Gora”, humid hornbeam forest, 3.06.2003, 1 ♂ (S. Zrazhewsky, Yu. Verves); Trakhtemyriv village, 30 km N of Kaniv, 30.06. & 4.07.1988, 2 ♂ (S. Zrazhewsky). Chernigiv Region: Ichnya District: “Trostyanetz” dendrological park, meadows and forest at lake coast, 5-11.08.1999, 59 ♂, 1 ♀. Kyiv City: Desna District: 5 ♂ “Lisova” subway-station, 5 km E, mixed forest and bushes near lake Lisove, 20.07.2004, 1 ♂; Dnipro District: “Hydropark”, nr Berizka lake, 22.06.2006 & 16.06.2010, Hosiiv District: Baykove Cemetery, 13.07.-7.08.2003, 5 ♂; “Didorovsky” pond, humid banks, 25.08-4.09.1999, 11.07-9.08.2002, 9 ♂ 1 ♀; Hosiiv park in memory Maxym Rylsky, 10.06.2009, 1 ♂; Kozacha street, 7.07.2005, 1 ♂; “Sovky hole”, coast of pond, humid meadow, 30.07. and 29.08.2002, 2 ♂, 1 ♀; “Theophania” park, 11.06.-29.07.2013, 38 ♂, 2 ♀; “Pyrogiv” field museum,

¹¹ This data is absent in modern catalogues (Pape 2006; Verves, 1986).

24.08.1999, 28.05.2000, 19 ♂; Vasylykivska street 33, yard, at leaves and walls, 25.06.-8.08.2008, 18.05.-31.07.2009, 31.05. & 7.07.2010, 61 ♂, 3 ♀; Vasylykivska street 98, yard, 5.05.-10.08.2002, 40 ♂, 5 ♀; indoor of laboratory building, on windows, 5.09.2002, 1 ♀; Williams street, dry meadows, 12-19.08.2002, 1 ♂, 1 ♀; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 5 ♂, 1 ♀; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000, 15.07.2005, 4 ♂, 1 ♀; Kyiv Region: Bila Tzerkva City: "Oleksandriya" park, 3.05.2009, 2 ♂; Kyiv-Svyatoshyn District: Irpin City, 2-4 km E, forest nr bog, 26.04.2003, 1 ♂ (Yu. Verves); Novosilky village, maple forest, host (larva of geometrid moth, *Agriopsis aurantaria*) collected in April 1987, 1 ♂, bred 28-29.05.1987 (V. Rafalskiy); Obukhiv District: Velyki Dmytrovychi village, asp forest nr bog, 4.07.1994, 27.06.1997, 4.07.1999, 20 ♂ (Yu. Verves). Sumy Region: Romny City: banks of Romenka river, meadows and bushes, 21-27.08.2009, 1 ♂. Zakarpattya Region: Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140 m a. s. l., 16 & 19.08.2014, 3 ♂, 1 ♀ (Yu. Verves).

40. *Heteronychia* (s. str.) *rohdendorfi* (Povolný & Slamečková, 1959)

Distribution: Palaearctic: Europe: AT, CZ (Moravia), CH, DE, FR (mainland), GR, HU, IT (mainland and Sicily), PL, RO, SK, UA: Chernivtsi, Ivano-Frankivsk, Kyiv City and Zakarpattya Regions.

Flies are distributed in undisturbed limestone habitats from lower elevations up to the mountainous habitats especially in the Carpathians and the Alps (Povolný, 1999).

41. *Heteronychia* (s. str.) *rohdendoriana* (Mihályi, 1975)

Distribution: Palaearctic: Europe: AT, BG, CH, CZ (Moravia), DE (Bavaria), HU, PL, SK, UA: Chernivtsi, Ivano-Frankivsk and Zakarpattya Regions.

Larvae are the endoparasites of terrestrial snails *Arianta arbustorum*, *Brachybaena fruticum* and *Monachoides incarnata*. The large specimens live in mountains, small - in foothill humid forests (Povolný, 1982).

Material examined: Zakarpattya Region: Mizhgirrya District: Kolochava village, 2-4 km S, along Kvazovetz stream, 600-1000 m o. s. l., 12-14.08.1995, 2 ♂; 6 km W, board of Tereblya pond, 500 m o. s. l., 12. and 17.08.1995, 3 ♂ (Yu. Verves).

42. *Heteronychia* (s. str.) *schineri* (Bezzi, 1891)

Distribution: Palaearctic: Europe: AD, AT, BG, CH, CZ (Bohemia and Moravia), DE, FR (mainland), HR, HU, IT (mainland and Sicily), MK, PL, RO, RS, SK, UA; Asia: AZ, GE, TR. UA: Chernivtsi, Ivano-Frankivsk, Odesa*, Ternopil* and Zakarpattya Regions.

This species are reared in the laboratory on freshly killed snails (Richet et al., 2011). Adult flies associated with limestone territories or lowland flood-plain forests (common in mountain forests (Gudjabidze, 1970; Gunárová & Slamečková, 1966; Kejval, 1998; Richet et al., 2011); feed at flowers of *Sedum acre* (Draber-Moňko, 1973).

Material examined: Odesa Region: Ismail District: Maly Taman I., 15.07.2003, 2 ♂ (Yu. Protzenko). Ternopil Region: Zalishchyky City: coast of Dnister river, 20.05.1986, 1 ♀ (S. Zhrazhevsky).

43. *Heteronychia* (s. str.) *slovaca* Povolný and Slamečková, 1967

Distribution: Palaearctic: Europe: CZ (Bohemia and Moravia), FR (mainland), SK, UA: Ivano-Frankivsk and Kyiv Regions).

Flies were collected on the borders of mountain forests in Carpathians (Povolný, 1985; Verves, 1977).

44. *Heteronychia* (s. str.) *vagans* (Meigen, 1826)

Distribution: Palaearctic: Europe: AD, AT, BG, BE, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland), HR, HU, IE, IT (mainland, Sardinia and Sicily), LV, MD, NL, NO, PL, PT, RO, RS, RU (Arkhangelsk, Bashkortostan, Ivanovo, Kaliningrad, Karelia, Leningrad,

Moscow, Ryazan and Voronezh regions), SE, SK, UA, UK; Asia: CN (Heilongjiang), GE, JP (Hokkaido), RU (Amur, Khabarovsk, Kurily Is., Primorye and Sakhalin Regions), TR. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are endoparasites of helcid *Eulota maacki* (Artamonov, 1985) and succineid (Verves, 1976) snails. This species reared in the laboratory on freshly killed snails and bred from a dead helcid snail *Cepaea nemoralis* in nature (Richet et al., 2011). Flies most abundant near deciduous woodlands, poor pasture, thin forests and bushy habitats and are mostly common at lower elevations (Povolný & Verves, 1990, 1997; Richet et al., 2011); feed at flowers of *Anethum graveolens*, *Heracleum sibiricum*, *H. sphondylium*, *Phalacrologa septentrionale*, *Solidago canadensis* (Verves, 1975, 2003, 2013) and attracted to piglet carcasses (Prado e Castro et al., 2010).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 30 km N of Kaniv, 3-13.07.1988, 4 ♂ (S. Zrazhewsky). Chernigiv Region: Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 13.08.1999, 2 ♂. Kyiv City: Dnipro District: Hydropark, nr Berizka lake, 22.06.2006, 1 ♂; Holosiiv District: ponds "Sovky hole", 9.06.2011, 1 ♂; "Didorovsky" pond, humid banks, 25.08-4.09.1999, 11.07-9.08.2002, 12.09.2005, 19 ♂, 3 ♀; Kozacha street, on leaves and walls, 7.07.2005, 1 ♂; Kozachy I. at Dnipro, 11.08. & 9.09.2009, 1 ♂, 1 ♀. "Prospect Nauki" avenue, "Lysa Gora", hills, 19.08.2004, 1 ♂; "Pyrogiv" field museum, 24.08.1999, 28.05.2000, 10 ♂; National Exhibition Centre, bushes, 27.08.1999, 7 ♂; Vasylykivska street 33, yard, 27.07.2009, 1 ♂; Vasylykivska street 98, yard, 9.05-10.07.2002, 4 ♂; Williams street, dry meadows, 25.04.-19.08.2002, 9 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 2 ♂; (L. Khrokalo, Yu. Verves). Kyiv Region: Bila Tzerkva City: "Oleksandriya" park, 3.05.2009, 1 ♂; Kyiv-Svyatoshyn District: Irpin City, 2-4 km E, forest nr bog, 26.04.2003, 1 ♂; Moshchun village, humid meadows near forest stream, 8.09.2003, 1 ♂; Obukhiv District, Tatzenky village, 3 km S, 14.09.2003, 1 ♂ (Yu. Verves). Mykolaiv Region: Ochakiv District: Kinburn sandy area, 16.05.2003, 3 ♂, 2 ♀ (Yu. Protzenko). Poltava Region: Pyryatyn District: Deymanivka village, locality "Kuty", meadows, 8.07.2009, 1 ♂; Grabarivka village, meadows near Ruda river, 15.07.2009, 11 ♂, 3 ♀; Shkuraty village, meadows, 17.07.2009, 1 ♂ (A. Drozdovska, Yu. Verves). Sumy Region: Romny City: banks of Romenka river, meadows and bushes, 21-27.08.2009, 5 ♂, 1 ♀ (Yu. Verves).

45. *Heteronychia* (s. str.) *vicina* (Macquart, 1835)

Distribution: Palaearctic: Europe: AT, BG, CH, CZ (Moravia), DE, ES, FI, FR (mainland and Corsica), GR, HU, IE, IT, NO, PL, RS, SK, SE, UA, UK; Asia: GE, RU (Kabardi-Balkaria). UA: Chernivtsi and Volyn Regions.

This species was never recovered from invertebrate and vertebrate corpses (Blackith et al., 1994) and reared in the laboratory on freshly killed snails (Richet et al., 2011). Adult flies were observed in Alps at altitudes 1650-2300 m o. s. l. in associations *Caricion curvulae* and *Larici-Piceetum* (Menzel & Ziegler, 2002).

46. *Heteronychia* (*Pandelleola*) *boettcheri* (Villeneuve, 1912)

Distribution: Palaearctic: Europe: AT, GR, HR, HU, RO, RS, UA; Asia: AZ, CY, IL, IR, PA, SY, TR. UA: Crimea and Odesa* Regions.

Larvae are parasites of terrestrial snail *Theba pisana* (Lehrer, 2006). The adult flies were collected in mountains at altitudes up to 1200 m a. s. l. (Povolný, 1996); prefer steppe and hemideserts (Trofimov, 1969).

Material examined: Crimea: Bakhchysaray District: Beregove village, sandy area, 1-11.08.2004, 37 ♂, 40 ♀; Lenino District: Qazan Tip State Reserve, 10-13.05.2005, 2 ♂, 4 ♀ (L. Khrokalo, Yu. Verves). Odesa Region: Ismail District, Suvorove village, 23.08.2009, 1 ♂; Odesa City: Hydrobiological Station of University, 26.08.2009, 1 ♂ (V. Corobchysyn, Yu. Protzenko).

47. *Heteronychia (Pandelleola) filia* (Rondani, 1860)

Distribution: Palaearctic: Europe: AT, BE, BG, CH, CZ, ES HR, FR (mainland and Corsica), GR, HU, IT (mainland and Sardinia), MK, MT, NL, PL, RO, RS, RU (Voronezh Region), SK, (mainland and Balears Is.), UA, UK (England); North Africa: MA; Asia: IL, PA, TR. UA: Crimea, Donetsk, Kherson, Luhansk, Mykolaiv, Odesa and Zaporizzhya Regions.

Larvae attack supposedly healthy snails *Helix* sp. (Rostand, 1920); are known as endoparasites of *Cerutuella virgata* and *Theba pisana* (Coupland, 1994); reared in the laboratory on freshly killed snails (Richet et al., 2011) and bred from dead snails in nature (Povolný & Verves, 1990). This species shows dependency to dry habitats, especially forest steppes, preferring limestone, less formations (Povolný & Verves, 1997) and meadows with chalk soils (Emden, 1954). The adult flies feed on flowers of *Achillea millefolium*, *Euphorbia cyparissias*, *Pastinaca sativa*, *Thymus serpyllum* (Draber-Moňko, 1973).

Material examined: Crimea: Alushta City: 15 km NE, Rybache village, "Kanakskaya Balka" hollow, meadows, 5-8.05.2005, 1 ♂, 1 ♀ (L. Khrokalo); Theodosia Municipal Government: Karadagh Natural Reserve, 5.07.2006, 1 ♂ (A. Drozdovska). Mykolaiv Region: Ochakiv District: Parutino village, debris of antic city Olvia, 16.07.2006, 1 ♂ (Yu. Verves). Odesa Region: Ismail District: Kyslytzya village, 15 km SE, 2.08.2009, 2 ♂, 1 ♀; 5 km SE, 9.08.2009, 1 ♂; Maly Taman I., 15.07.2003, 1 ♂ (V. Gorobchyshyn, Yu. Protzenko). Zaporizzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 4 ♂; Artemivsk District: Kyrlyivka village, Fedotova kosa, sandy area nr sea coast, 16.08.1997, 6 ♂, 2 ♀; Berdyansk City: sandy spit at Azov Sea, 14-17.08.1994, 6 ♂, 2 ♀ (Yu. Verves).

48. *Heteronychia (Pandelleola) filiola* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: UA: Crimea.

Flies were collected in mountains alp steppe ("yayla") on stones (Verves, 1978).

Material examined: Crimea: Lenino District: Qazan Tip State Reserve, at sea board on stones, 10.05.2005, 2 ♂ (L. Khrokalo).

49. *Karovia hirticrus* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AD, AL, AT, BG, CH, CZ, DE, ES (mainland and Balears Is.), FR (mainland and Corsica), HR, HU, IT (mainland and Sicily), MT, PL, PT, RO, RS, SE, SK, UA, UK (England); North Africa: DZ; Asia: AZ, GE, IL, RU (Krasnodar Region). UA: Cherkasy, Chernivtsi, Crimea, Ivano-Frankivsk, Kherson, Kyiv, Zakarpattya and Zaporizzhya Regions.

Larvae in nature are bred from a swallows' corpses and numerous dead terrestrial snails *Cepaea nemoralis* (Beaver, 1972, 1973, 1977), living snails *Cantareus aspersus* (Barfoot, 1969), *Cerutuella virgata* (Coupland, 1994) and *Theba pisana* (Coupland & Baker, 2004; Richet, 1990); reared in the laboratory from pig liver (Pérez-Moreno et al., 2006). Flies are strongly heliophilic accompanying habitats and hill tops, especially at lower elevations, with decreasing densities towards mountain ranges (Povolný & Verves, 1997) at altitudes up to 1600 m o. s. l. (Povolný, 1999). Adults common in synanthropic stations (Trofimov, 1969); were collected by trap baited a fleshly killed piglet (Prado e Castro et al., 2011) and related to corpses (Castillo Mirables, 2002; Romero et al., 2003).

Material examined: Crimea: Bakhchysaray District: Beregovye village, loam sea shores, 14-16.08.1996, 1 ♂; Lenino District: Qazan Tip State Reserve, 17-29.07.2007, 11 ♂, 4 ♀. Kherson Region: Chapline District: Askania-Nova Biosphere Reserve, park, 22-28.07.2008, 14 ♂. Zaporizzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 4 ♂. Berdyansk City: sandy spit at Azov Sea, 14-17.08.1994, 4 ♂ (Yu. Verves).

Subtribe Phallanthina**50. *Asceloctella (Mimarhopocnemis) granulata* Kramer, 1908**

Distribution: Palaearctic: Europe: AT, BG, CZ (Moravia), DE, ES, FI, FR (mainland), HR, HU, IT (mainland), PL, RO, RS, RU (Leningrad and Voronezh Regions), SK, UA: Cherkasy, Chernigiv, Chernivtsi, Dnipropetrovsk, Kyiv, Poltava* and Zhytomyr Regions.

Flies were feed on excreta of aphids *Rhopalosiphum padi* at leaves of *Prunus padus* (Draber-Mońko, 1973). This species accompanies especially undisturbed humid and warm lowland forests along rivers (Povolný & Verves, 1997).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, Krugly I., 1.07.1986, 1 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 7.07.-19.08.2000, 28 ♂. Kyiv City: Desna District: "Lisova" subway-station, 5 km E, mixed forest and bushes near lake Lisove, 20.07.2004, 2 ♂; Hosiiv District: "Didorovsky" pond, humid banks, 4.09.1999 & 9.08.2002, 3 ♂; "Sovky hole", coast of pond, humid meadow, 31.07.2002, 1 ♂. Kyiv Region: Boryspil District: Rozhny village, bog at coast of Dnipro, 16-21.08.1999, 11 ♂ (Yu. Verves). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13 and 15.08.2010, 1 ♂; Pyryatyn District: Kharkivtzy village, 2 km S, locality "Velyki Solontzi", 13-14.07.2009, 3 ♂; Lelyaky village, meadows at bank of Uday river, 12. & 16.08.2010, 3 ♂ (O. Tkachenko, Yu. Verves).

51. *Bellieriomima subulata* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland), HR, HU, IT (mainland), NL, NO, PL, RO, RS, RU (Bashkortostan, Karelia, Leningrad and Voronezh Regions), SE, SK, UA, UK (England); Asia: AZ, GE, KZ, RU (Altai, Amur and Tuva Regions). UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Ivano-Frankivsk, Kirovograd, Kyiv, Poltava, Sumy*, Volyn, Zakarpattia and Zhytomyr Regions.

Larvae are bred from pupae *Porthetria dispar* (Girfanova, 1957) and terrestrial snails (Povolný & Verves, 1990); reared in the laboratory on chopped grasshoppers (Richet et al., 2011). Adult flies associated with limestone territories or lowland flood-plain mesophytic and humid forests, parks and gardens; feed on flowers of *Solidago canadensis* (Verves, 2013), aphids' excreta, dead invertebrate and small vertebrate animals (Kejval, 1998; Povolný & Verves, 1997).

Material examined: Chernigiv Region: Borzna District: Makoshyno village, right coast of Desna, meadows, 20.08.2000, 1 ♂; Ichnya District: "Trostanetz" dendrological park, meadows and forest at lake coast, 8.08.1999, 1 ♂. Kyiv City: Dnipro District: Hydropark, bushes, 16.06.2010, 4 ♂; Hosiiv District: "Didorovsky" pond, banks, 9.08.2002, 1 ♂; Hosiiv Park in memory Maxym Rylsky, 10.06.2009, 1 ♂; National Exhibition Centre, bushes, 27.08.1999, 1 ♂; "Theophania" park, 11.06.2013, 1 ♂; Vasylykivska street 33, yard, 23.06.2009, 1 ♂; Vasylykivska street 98, yard, 28.05.2002, 1 ♂. Poltava Region: Pyryatyn District: Grabarivka village, meadows near Ruda river, 15.07.2009, 1 ♂. Sumy Region: Romny City: banks of Romenka river, meadows and bushes, 21-27.08.2009, 1 ♂ (Yu. Verves).

52. *Krameromyia anaces* (Walker, 1849)

Distribution: Palaearctic: Europe: AT, BG, CH, CZ (Bohemia and Moravia), DE, DK, ES, FR (mainland), HR, HU, IT (mainland and Sicily), PL, PT, RS, SK, UA, UK (England); North Africa: DZ; Asia: TR. UA: Chernivtsi, Odesa and Zakarpattia Regions.

Larvae are parasitoids of different terrestrial snails: *Cernuella explanata*, *C. virgata*, *Cochlicella acuta*, *Theba pisana* (Böttcher, 1912; Coupland, 1994; Coupland & Baker, 2004; Hopkins & Baker, 1993; Povolný & Verves, 1990) and reared on dead snail *Cepaea nemoralis* (Richet, 1990). The species frequents open sunlit, dry and warm habitats on sand, loess and generally poor soils, avoiding higher elevations and dense vegetation of shrubs and trees (Povolný & Verves, 1997), chalk grasslands and limestone hillsides (Rudzinski & Flügel, 2007). Flies feed on flowers of *Cerastium semidecandrum*, *Euphorbia cyparissias*, *Thymus serpyllum* (Draber-Mońko, 1973) and attracted to corpses (Castillo Mirables, 2002).

53. *Myorhina (Mehria) nemoralis* (Kramer, 1908)

Distribution: Palaearctic: Europe: AT, BG, BY, CH, CZ (Moravia), DE, FI, FR, HR, HU, NL, NO, PL, RO, RS, SE, SK, UA; Asia: CN (Neimenggu), KZ, RU (Karachay-Cherkessia, Krasnoyarsk and Magadan Regions). UA: Cherkasy, Chernigiv*, Chernivtsy, Ivano-Frankivsk, Kyiv, Poltava, Zakarpattia and Zhytomyr Regions.

The species accompanies dry deciduous, especially beech forests in central Europe, but it occurs also on the hill-tops of the Carpathians up to 2100 m a. s. l. (Povolný & Verves, 1990).

Material examined: Chernigiv Region: Borzna district: Yaduty village, Biological Station of Nizhyn University, coast of lake, bushes, 19.08.2000, 1 ♂ (Yu. Verves).

54. *Myorhina (s. str.) lunigera* (Böttcher, 1914)

Distribution: Palaearctic: Europe: AT, BA, CH, CZ (Moravia), DE, FR (mainland), IT (mainland), PL, RO, RS, SK, UA; Asia: AM, GE, RU (Karachay-Cherkessia, Krasnodar and Stavropol Regions). UA: Chernivtsy and Zakarpattia Regions.

This montane species accompanies beech forests, bogs and meadows, preferring limestone habitats at elevations of 490-1750 m a. s. l. (Povolný & Šustek, 1983; Povolný & Verves, 1997; Slamečková, 1961).

Material examined: Zakarpattia Region: Mizhgirrya District, Kolochava village, 5 km W, 1000-1400 m a. s. l., alp steppe, 14.08.1995, 1 ♂ (Yu. Verves).

55. *Myorhina (s. str.) nigriventris* (Meigen, 1826)

Distribution: Palaearctic: Europe: AD, AL, AT, BE, BG, CH, CZ (Bohemia and Moravia), DE, DK, ES, FR (mainland and Corsica), GR, HR, HU, IE, IT (mainland, Sardinia and Sicily), MT, NL, PL, PT, RO, RS, SE, SK, UA, UK; North Africa: DZ, LY, MA, TN; Asia: AM, AZ, CY, GE, RU (Chechnya, Dagestan, Karachay-Cherkessia, Krasnodar, Primorye and Stavropol Regions), TR. UA: Cherkasy, Chernivtsi, Crimea, Dnipropetrovsk, Ivano-Frankivsk, Kherson, Kyiv, Mykolaiv, Odesa, Zakarpattia and Zaporizhzhya Regions.

Larvae are bred in mummified small vertebrates: mice, birds etc. (Blackith & Blackith, 1990; Blackith et al., 1994), living and dead snails *Brephulopsis cylindrica* (Povolný & Verves, 1997), *Candidula intersecta* (Coupland & Baker, 2004), *Cantareus aspersus* (Barfoot, 1969), *Cepaea nemoralis* (Beaver, 1969, 1972; Richet, 1990; Richet et al., 2011), *Cernuella virgata* (Keilin, 1919), *Eobania vermiculata* (Coupland & Baker, 2004), *Helicella itala* (Bowell, 1917), *Helicopsis retowskii* (Verves & Khrokalo, 2006), *Helix pomatia* (Cameron & Disney, 1975), *Monacha cantiana* (Böttcher, 1913; Cameron & Disney, 1975; Séguy, 1941), *Oxychilus harellus* (Verves & Khrokalo, 2006), *Theba pisana*, *Xerolenta obvia* (Coupland & Baker, 2004), *Xeropicta krynichii* (Verves & Khrokalo, 2006). Maggots are known as parasites of egg-sucks and adult locusts *Schistocerca gregaria* (Séguy, 1932, 1953); larvae of carabid beetle *Carabus coriaceus*, adult beetles *Blaps macronata* (Emden, 1950), *Necrophorus humator* (Gimingham, 1922), *Procrustes coriaceus* (Séguy, 1941); *Apis mellifera* larvae (Guilhon, 1945, 1950) and adults (Séguy, 1965); larvae of *Bombus terrestris* (Smith, 1957). This species reared in the laboratory on freshly killed snails and different insects (Richet et al., 2011). Flies feed at flowers of *Achillea*, *Bellis*, *Erigeron*, *Euphorbia*, *Medicago*, *Pyrethrum*, *Rhamnus*, *Thymus*, excreta of aphids, destroyed organic matters (Draber-Mońko, 1973; Jędrzejewska-Szmek & Zych, 2013; Povolný & Verves, 1997; Verves & Khrokalo, 2006), attracted to freshly killed piglet (Prado e Castro et al., 2010). Females bear 2nd stage larvae, which feed in their uterus by the excreta of special glands (Guilhon, 1945). This species is very adaptive: it occurs especially in dry sunlit habitats of both natural and secondary character, population densities distinctly decreasing in north of the distributional area and at high elevations (Povolný & Verves, 1997); associated with limestone hillsides, chalk grasslands, lowland flood-plain forests, vineyards (Kejval, 1998; Richet et al., 2011; Rudzinski & Flügel, 2007) up to 2100 m o. s. l. (Ziegler & Lange, 2001).

Material examined: Crimea: Bakhchysaray District: Beregove village, sandy area, 4-11.08.2004, 7 ♂; Lenino District: Qazan Tip State Reserve, 10-13.05.2005 & 23-29.07.2007, 20 ♂, 22 ♀ (L. Khrokalo, Yu. Verves). Kherson Region: Genichesk District: Chernigivka village, coast of

Sivash lagoon, sandy and dry steppe areas, 7-26.07.1998, 20-26.07.1998, 7♂; Gola Prystan District: Chornomorsky State Reserve, Ivano-Rybalchansky branch, 22.07.2006, 1 ♂. Kyiv City: Holosiiv District: Baykove Cementery, 7.08.2003, 2 ♂; "Didorovsky" pond, humid banks, 11.07.2002, 1 ♂; Holosiiv Park in memory Maxym Rylsky, 10.06.2009, 1 ♂; Vasylykivska street 98, yard, 8.8.2002, 1 ♂; "Prospect Nauki" avenue, hills "Lysa Gora", bushes, 8.05.2003, 4 ♂; Podil District: Shevchenko square, shores of lakes, 27.09.2006, 1 ♂ (Yu. Verves). Odesa City: Hydrobiological Station of University, 26.08.2009, 3 ♂, 6 ♀ (Yu. Protzenko). Zaporizzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 16 ♂, 1 ♀ (Yu. Verves).

56. *Myorhina (s. str.) pandifera* (Blackith and Pape, 1999)

Distribution: Palaearctic: Europe: AT, CH, CZ (Moravia), DE, FR (mainland), HR, IT (mainland), PL, RO, SK, UA: Chernivtz Region.

This species prefers habitats (alp steppe and beech forests) at elevations of 600-1750 m a. s. l. (Povolný & Šustek, 1983; Verves, 2001).

57. *Myorhina (s. str.) socrus* (Rondani, 1860)

Distribution: Palaearctic: Europe: AD, AL, AT, BG, CH, CZ (Moravia), DE, EE, FI, FR (mainland), GR, HU, IT (mainland and Sicily), PL, RS, RU (Kaliningrad, Karelia and Leningrad Regions), SK, UA; Asia: RU (Dagestan). UA: Cherkasy, Chernivtsi, Crimea, Dnipropetrovsk, Kyiv and Poltava* Regions.

This species is reared in the laboratory from chopped grasshoppers (Richet et al., 2011). Flies are strictly heliophilous and ascend to considerable altitudes up to more than 1600 m a. s. l., showing hilltopping strategy in mountains. At lower elevations they seek sunlit hilltops in forested habitats and occur also on sea shores. Adult flies visit decaying small carcasses and faeces (Povolný & Verves, 1990, 1997); feed on flowers of *Rhamnus frangula* and *Peucedanum cervaria* (Draber-Mońko, 1973).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, Shelestiv I., bushes at coast of Dnipro, 24.06. and 19.7.1988, 2 ♂ (S. Zrazhewsky); Liplyave village, 9.08.2003, 1 ♂ (A. Drozdovska). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 24.08.2000, 1 ♂. Poltava Region: Pyryatyn District: Shkuraty village, meadows, 17.07.2009, 1 ♂ (Yu. Verves).

58. *Myorhina (s. str.) soror* (Rondani, 1860)

Distribution: Palaearctic: Europe: AT, BG, CH, CZ (Moravia), DE, DK, EE, ES, FR (mainland), HR, HU, IE, IT (mainland and Sicily), NO, PL, RO, RU (Kaliningrad and Leningrad Regions), SE, SK, UA; North Africa: ES (Canary Is.); Asia: AM, AZ, GE, IL, RU (Chechnya), SY, TR. UA: Cherkasy, Chernivtsi, Crimea, Ivano-Frankivsk, Kherson, Zakarpattia and Zaporizzhya Regions.

Larvae are developed in terrestrial snail *Cantareus aspersus* (Séguy, 1921) and reared in the laboratory from chopped grasshoppers (Richet et al., 2011). Flies are heliophilic and prefer limestone habitats, mainly cliffs of mountain elevations, sometimes up to 2300 m a. s. l., less common at lower elevations and in other edaphic conditions, especially where calcareous rocks outcrop; feed at flowers of *Heracleum* (Menzel & Ziegler, 2002; Povolný, 1999; Povolný & Verves, 1997; Richards, 1960).

Material examined: Crimea: Bakhchysaray District: Beregove village, sandy area, 4-8.08.2004, 7 ♂ (Yu. Verves).

59. *Myorhina (s. str.) villeneuvei* (Böttcher, 1912)

Distribution: Palaearctic: Europe: AT, BE, BG, BY, CZ (Moravia), DE, EE, ES, FI, FR (mainland), HU, IT (mainland), MNE, NL, PL, RS, RU (Bashkortostan, Karelia, Leningrad, Tambov, Voronezh and Yaroslavl Regions), SE, SK, UA, UK; Asia: CN (Heilongjiang, Xinjiang), JP

(Hokkaido), RU (Altai and Primorye Regions). UA: Cherkasy, Chernigiv*, Chernivtsi, Ivano-Frankivsk, Kyiv and Zhytomyr Regions.

Larvae are developed in dead insects. Adult flies feed at aphid excreta, accompany humid habitats, e. g. lowland forests near rivers and ponds, acid natural meadows and swamps (Artamonov, 1996; Povolný & Verves, 1997; Verves & Khrokalo, 2006).

Material examined: Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 7.07.-19.08.2000, 8 ♂, 1 ♀. Kyiv City: Holosiiv District: "Didorovsky" pond, humid banks, 25.08.1999, 1 ♂; Dnipro District: Moscow bridge, 2 km N, island on Dnipro, 16. and 30.05.2008, 2 ♂. Kyiv Region: Brovary District: Zazymya village, 5 km N, meadows nr Desna river, 1.08.2001, 2 ♂ (Yu. Verves).

60. *Myorhina (Mehria) nemoralis* (Kramer, 1908)

Distribution: Palaearctic: Europe: AT, BG, BY, CH, CZ (Moravia), DE, FR (mainland), FI, HR, HU, IT (mainland), NL, NO, PL, RO, RS, SE, SK, UA; Asia: CN (Neimenggu), KZ, RU (Karachay-Cherkessia, Krasnoyarsk and Magadan Regions). UA: Cherkasy, Chernigiv*, Chernivtsy, Ivano-Frankivsk, Kyiv, Poltava, Zakarpattia and Zhytomyr Regions.

Flies feed on flowers in mesophytic herbaceous localities: meadows, forest borders etc. (Verves & Khrokalo, 2006) at altitudes up to 2100 m a. s. l. (Povolný & Verves, 1990).

Material examined: Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 19.08.2000, 1 ♂ (Yu. Verves).

61. *Pandelleana protuberans* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AT, BG, CH, CZ (Moravia), DE, ES, FR (mainland and Corsica), HR, HU, IE, IT (mainland and Sicily), MD, NL, PL, RS, RU (Orenburg, Voronezh), SK; Asia: AM, AZ, CN (Hebei, Shandong, Shanxi, Xinjiang), CY, GE, KZ, RU (Kabardi-Balkaria, Karachay-Cherkessia and Novosibirsk Regions), TR. UA: Chernivtsi, Crimea, Dnipropetrovsk, Ivano-Frankivsk, Kherson, Luhansk, Vinnytsia* and Zaporizhzhya Regions.

Larvae are predators of eggs of lizards *Iberolacerta aranica*, *I. aurelioi* and *I. bonnali* in Spanish Pyrenees at alt. 1100 m a. s. l. and *Podarcis muralis* at alt. 100 m a. s. l. (Arribas & Galán, 2005; Pape & Arribas, 1999). This species reared in the laboratory on raw hen's eggs (Richet et al., 2011). Flies active in warm dry habitats, especially on limestone, loess and sand, from ultimo May to primo July, with maximum flight activity in June; flies accompany undisturbed, natural, xeric and xerothermophilic habitats, especially of limestone, loess and sand ascending elevations up to 1000 m a. s. l. (Povolný, 1996).

Material examined: Luhansk Region: Antratsyt district: Dyakove village, 9.07.2000, 1 ♂ (S. Konovalov). Vinnytsia Region: Chechelnyk District: Chechelnyk Sity, 4,5 km S, "Karmelyuk's Podillya" National Nature Park, "Vyshenke" locality, 27.05.2014, 1 ♂ (V. Gorobchynshyn).

62. *Sarina olsouffevi* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: UA; Asia: AM, AZ, CN (Jilin, Liaoning), JP (Honshu), RU (Dagestan and Primorye Regions). UA: Cherkasy, Crimea*, Dnipropetrovsk and Kyiv Regions.

Flies prefer mesophytic meadows and forest borders (original data).

Material examined: Crimea: Lenino District: Qazan Tip State Reserve, 13.05.2005 & 19.07.2007, 2 ♂ (L. Khrokalo, Yu. Verves).

63. *Sarina sexpunctata* (Fabricius, 1805)

Distribution: Palaearctic: Europe: AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, ES, FI, FR (mainland), GR, HR, HU, IE, IT (mainland), NL, NO, PL, RO, RS, RU (Kaliningrad, Karelia, Leningrad, Moscow, Perm and Voronezh Regions), SE, SK, UA, UK; North Africa: ES (Canary Is.); Asia: AM, CN (Beijing, Heilongjiang, Jilin, Liaoning, Sichuan, Tianjin, Xinjiang), JP (Hokkaido, Honshu), KZ, MN, RU (Amur, Chita, Chukotka, Kamchatka, Khabarovsk, Krasnoyarsk, Kurily, Magadan, Novosibirsk, Primorye and Sakhalin Regions), TR. UA: Cherkasy, Chernigiv,

Chernivtsi, Crimea, Dnipropetrovsk, Ivano-Frankivsk, Kherson, Kyiv, Zakarpattia and Zhytomyr Regions.

Larvae are the parasites of egg cocoons of spiders *Larinioides cornutus* (Finch, 2005; Mik, 1890), and *Clubiona* spp. (Lundbeck, 1927). This species found mostly at lower elevations, especially in humid warm lowground forests, and undisturbed habitats on forest margins up to foothills of mountains (Povolný & Verves, 1997); associated with limestone territories or lowland flood-plain forests (Kejval, 1998); feed on excreta of aphid *Eleucanium corni*, flowers of *Mentha* sp. (Draber-Moňko, 1973), *Frangula alnus* (Čepelák, 1956), Asteraceae, Euphorbiaceae etc. (Povolný & Verves, 1997); visit the small corpses of vertebrate animals (Blackith & Blackith, 1990).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 7.06.2003, 1 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 11-12.07.2000, 3 ♂ (Yu. Verves).

64. *Thyrsocnema incisilobata* (Pandellé, 1896)

Distribution: Palaearctic: Europe: AD, BE, BG, BY, CH, CZ (Moravia and Bohemia), DE, DK, EE, ES, FI, FR (mainland), HR, HU, IE, IT (mainland and Sardinia), LT, MK, MD, NL, NO, PL, RO, RU (Bashkortostan, Ivanovo, Karelia, Moscow, Leningrad, Lipetsk, Voronezh and Yaroslavl Regions), RS, SE, SK, UA; Asia: AM, AZ, GE, KZ, RU (Dagestan, Kabardi-Balkaria, Kamchatka, Novosibirsk, Tyumen, Stavropol and Sverdlovsk Regions), TR, UZ; UA; North Africa: DZ; Asia: AM, AZ, GE, KZ, RU (Dagestan, Kabardi-Balkaria, Kamchatka, Novosibirsk, Stavropol and Sverdlovsk Regions), TR, UZ. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kyiv, Lviv, Poltava, Rivne, Sumy, Ternopil, Vinnytsia*, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are developed in faeces, sometimes corpses (Séguy, 1941; Verves & Khrokalo, 2006); known as facultative predators of lepidopteran pupae *Lymantria monacha* (Komárek, 1938), endoparasites of locust *Stauroderus maroccanus* (Séguy, 1941), snail *Otala lactea* (Keilin, 1919), and not develop in dead snails (Blackith et al., 1994); caused urogenital myiasis of 86-year old man (Pospíšil & Povolný, 1980). Eurycious species with strong culturophilic tendencies, occurring in secondary changed habitats; adult flies associated with limestone territories or lowland flood-plain forests (Kejval, 1998; Povolný & Verves, 1997); visit the small corpses of vertebrate animals (Blackith & Blackith, 1990), fruits, meat and faeces (Povolný & Verves, 1997), flowers of *Anethum graveolens* (Verves, 2003), *Angelica* sp., *Carum carvi*, *Daucus* sp., *Euphorbia cyparissias*, *Pastinaca* sp., *Rhamnus catharica* (Draber-Moňko, 1973; Séguy, 1941), *Pimpinella saxifraga* (Girfanova, 1958), *Taraxacum officinale* (original data).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 16-19.08.1988, 2 ♂ Trakhtemyriv village, 30 km N of Kaniv, 9.07.1988, 1 ♂; (S. Zrazhewsky); 20.05.2003, 1 ♂; Uman City: Dendrological park "Sofiivka", 11.06.2005, 3 ♂; 13-14.06.2006, 2 ♂, 2 ♀. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 11.06.-25.08.2000, 46 ♂; Ichnya District: "Trostyanyet" dendrological park, meadows and forest at lake coast, 5-13.08.1999, 41 ♂ (Yu. Verves); Korop District: Obolonye village, near forest, 17.07.2003, 1 ♂; Koryukivsky District: Gutyshche village, near pond, 3-7.07.2003, 1 ♂ (L. Khrokalo, A. Drozdovska). Crimea: Simferopol, 27.08.2004, 1 ♂ (Yu. Verves). Kyiv City: Holosiiv District: Baykove Cemetery, 7.08.-30.09.2003, 3 ♂; "Didorovsky" pond, humid banks, 4.09.1999, 1 ♂; 11.07.2002, 21.09.2003 & 28.06.2004, 5 ♂; National Exhibition Centre, bushes, 27.08.1999, 1 ♂; "Prospect Nauki" avenue, hills "Lysa Gora", bushes, 17.08.2004, 1 ♂; "Theophania" park, 11.06. - 29.07.2013, 23 ♂, 2 ♀; Vasylkivska street 33, yard, 28.07.2009 & 25.06.2010, 12 ♂; Vasylkivska street 98, yard, 15.05.-22.07.2002, 10 ♂; Williams street, dry meadows, 10-28.07.2001 & 12.08.2002, 9 ♂ (A. Drozdovska, Yu. Verves). Kyiv Region: Boryspil District: Rozhny village, bushes at coast of Dnipro, 18.08.1999, 1 ♂; Brovary District: Zazymya village, 5 km N, 1.08.2001, 3 ♂; Kyiv-Svyatoshyn District: Gostomel, 4 km N, meadows at right bank of Irpin river, 8.07.2001, 3 ♂; Obukhiv District: Velyki Dmytrovychi village, forest nr bog, 4.07.1994, 27.06.1997, 2.05. & 4.07.1999, 10 ♂; Tatzenky village, 3 km S, at leaves and ground at border of pine forest nr lake, 14.09.2003, 3 ♂ (Yu. Verves); Skvyra District: Pustovarivka village, 26-27.06.2004, 2 ♂ (A. Drozdovska). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13 and 15.08.2010, 1 ♂; Pyryatyn District: Bilotzerkivtzi village,

locality Murentzeve, 15.08.2010, 1 ♂; Davydivka village, meadows, 15.07.2009, 1 ♂; Deymanivka village, 16.7.2005, 1 ♂; Grabarivka village, meadows near Ruda river, 15.07.2009, 21 ♂, 3 ♀; Keybalivka village, meadows at bank of Uday river, 11-17.07.2009, 2 ♂, 1 ♀; Kharkivtzy village, 2 km S, locality "Velyki Solontzi", 13-14.07.09, 1 ♂; Masalske village, meadows at bank of Uday river, 14.08.2010, 1 ♀ Shkuraty village, meadows, 17.07.2009, 2 ♂; (A. Drozdovska, V. Gorobchyshyn, O. Tkachenko, Yu. Verves). Sumy Region: Sumy District: Mogrytzya village, 7-9.08.2009, 1 ♂ (Yu. Protzenko); Romny City, banks of Romenka river, meadows and bushes, 21-30.08.2009, 13 ♂; at flowers of *Taraxacum officinale*, 5.05.2013, 1 ♂. Vinnytsia Region: Chechelnyk District: "Karmelyuk's Podillya" National Nature Park, Lyubashivka village, 5.07.2013, 1 ♂ (V. Gorobchyshyn). Zakarpattia Region: Mizhgirrya District: Kolochava village, 2-4 km S, along stream Kvasovetz, 600-1000 m a. s. l., 12.08.1995, 2 ♂; 5 km W, 1000-1400 m a. s. l., alp steppe, 14-15.08.1995, 2 ♂; Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140 m a. s. l., 23.08.2014, 1 ♂ (Yu. Verves); Velyko-Berezna District: Vyshka village, pupa from uninhabited nest *Sceliphron* sp., collected 10.01.2010, reared 10-18.06.2010, 1 ♂ (D. Gladun). Zaporizzhya Region: Akymivka District: Bogatyrs'k biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 1 ♂; meadows and bushes, 4-15.06.2008, 1 ♂; Melitopol City: "Kamyany Mogily" Reserve, at stones, 28.08.1997, 4 ♂ (Yu. Verves).

65. *Thyrsocnema kentejana* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: AT, BG, CH, FI, FR (mainland), NO, RO, SE, SK, UA; Asia: CN (Hebei, Heilongjiang, Jilin, Liaoning, Neimenggu, Qinghai, Shanxi, Sichuan, Xinjiang), KZ, MN, RU (Altai, Amur, Buryatia, Chita, Khabarovsk, Krasnoyarsk, Primorye and Tuva Regions), TJ, Tibet. Oriental: CN (Yunnan), IN (Jammu and Kashmir), PK (North-West Frontier). Nearctic: US (Alaska). UA: Zakarpattia Region.

Larvae are developed in corpses of insects, birds, small mammals, faeces (Artamonov, 1993). Flies feed on flowers, faeces, corpses; prefer mesophytic forest borders, meadows; show partly culturophile tendencies in eastern parts of distribution (Povolný & Verves, 1997; Verves & Khrokalo, 2006).

Material examined: Zakarpattia Region: Mizhgirrya District: Kolochava village, 2-4 km S, along stream Kvazovetz, 600-1000 m a. s. l., 12.08.1995, 1 ♂ (Yu. Verves).

Subtribe Parasarcophagina

66. *Bercaea africa* (Wiedemann, 1824)

Distribution: Palaearctic: Europe: AL, AT, BA, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, ES (mainland and Balears Is.), FR (mainland and Corsica), GR, HR, IE (mainland and Clare I.), IT (mainland, Sardinia and Sicily), LT, LU, LV, MD, MK, MNE, MT, NL, NO, PL, PT, RO, RS, RU (Astrakhan, Bashkortostan, Ivanovo, Karelia, Leningrad, Lipezk, Moscow, Pskov, Tatarstan, Tula, Volgograd and Voronezh Regions), SE, SI, SK, TR, UA, UK; North Africa: DZ, EG, ES (Canary Is.), LY, MA, PT (Azores and Madeira), TN; Asia: AF, AM, AZ, CN (Beijing, Gansu, Hebei, Henan, Neimenggu, Ningxia, Qinghai, Shaanxi, Shandong, Shanghai, Shanxi, Sichuan, Xinjiang), CY, EG (Sinai), GE, IL, IQ, IR, JO, KG, KP, KR, KW, KZ, LB, MN, PA (incl. Gaza Strip.), RU (Alania, Altai, Amur, Dagestan, Chechnya, Ingushetia, Khabarovsk, Krasnodar, Primorye, Stavropol and Tuva Regions), SA, SY, Tibet, TJ, TM, TR, UZ. Nearctic: CA (Ontario and Quebec), US (California, Connecticut, Colorado, Florida, GE, Illinois, Iowa, Kansas, Massachusetts, Missouri, Montana, New Jersey, New Mexico, New York, North Carolina, Oregon, Texas and Wyoming). Afrotropical: AO, BF, BI, BJ, BW, CG, CI, CM, ER, ET, GA, GH, GM, KE, LR, LS, MR, MW, MZ, NA, NG, RW, SH, SL, SO, SD, TZ, TG, UG, YE, ZA, ZM, ZW, Madagascan: MG, MU (mainland, Cargados Is. and Rodrigues Is.), RE, SC (Aldabra Is., Amirantes Is., Granitic Is. and Mahe I.). Oriental: BT, IN (Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Nicobar Is., Punjab, Sikkim, Uttar Pradesh and West Bengal), NP, PK (Karachi); TH, VN. Australasian/Oceanian: AU (New South Wales, Queensland, South AU and Western AU), CL (Easter I.), EC (Galapagos Is.), US (Hawaii). Neotropical: AR (Buenos Aires and Mendoza Provinces), BR (Rio de Janeiro and Rio Grande do Sul), CR, CU, MX,

PA, PY. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae of this eusynanthropic species are found in decaying animal matter, generally in human faeces, including refuse pits, lavatories, dustbins; rarely in bovine and buffalo pork, dung, rotten meat (Al-Misned, 2000, 2003a, b; Al-Misned & Abou Fannah, 2000; Al-Misned et al., 1999; Artamonov, 1983; Gadzhay, 1963; Gorbacheva, 1956; Kirchberg, 1961; Stackelberg, 1956; Sukhova, 1952; Sychevskaya, 1957; Zakharova, 1961), beached cephalopod and echinoid carrion (Artamonov, 1983), dead insects (Zumpt, 1972), piglet carcasses (Prado e Castro et al., 2010), and human remains; the latest is important for forensic investigations (Al-Mesbah, 2010; Cherix et al., 2012; Di Fazio et al., 1998; Frost et al., 2010; Goff, 1991; Introna et al., 1998; Kim et al., 2014; Leccese, 2004; Vanin et al., 2007); reared in the laboratory on beef (Richet et al., 2011). As a result, this species can breed in decaying meat, rotten floodstuffs and similar organic matter, but faeces are its main habitat (Hall & Smith, 1993). The larvae were the early arrivals in the fresh stage of carcasses of wildlife species: greater cane rat, *Thyromys swinderianus*; two-spotted palm civet, *Nandina binotata*; the mona monkey, *Cercopithecus mona*; the Maxwell's duiker, *Philantomba maxwelli* in rain forest (Ndueze et al., 2013). Maggots cause different types of myiasis (Mulieri et al., 2010): occasional intestinal (Aldrich, 1916; Ali-Khan & Ali-Khan, 1974; Khan, 1987; Udgaonkar et al., 2012), cutaneous (Calero, 1948), nosocomial (Dutto & Bertero, 2010; Husain et al., 1993) and aural (Braverman et al., 1994; Cerruti, 1913a, b; Magliulo et al., 2000) myiasis of humans and wound myiasis in mammals: dogs (Khan, 1974; Principato et al., 1994), cattle (Dik et al., 2012) and known as predators of pupae of moth *Thaumetopoea pityocampa* (Biliotti, 1958), endoparasites (parasitoids) of snails *Cantareus asperatus*, *Cepaea nemoralis*, *Cernuella virgata*, *Eobania vermiculata*, *Theba pisana* (Berner, 1960; Coupland & Baker, 2004), millipede *Sechelleptus seychellarum* (Gerlach et al., 2005), locusts *Dociostaurus maroccanus*, *Locusta migratoria*, *Melanoplus* sp., *M. differentialis*, *Schistocerca cancellata*, *S. gregaria* (Rees, 1973). Adult flies attracted to faeces, dung, lavatories, rotten meat, decomposed fruits, mixed vegetations and flowering plants (Artamonov, 1992; Verves & Khrokalo, 2009). This species is wintering in pupal phase in soil in temporary climates (Lobanov, 1966). Flies were collected in mountains at altitudes up to 3000 m o. s. l. (Feng, 2006). Imagoes of great medical and veterinary importance as a vectors of disease agents: helminthes eggs *Ascaris lumbricoides* (Greenberg, 1971; Sychevskaya & Petrova, 1958), *Hymenolepis nana* (Alakhverdyanz & Zakharova, 1961), *Taeniarhynchus saginatus* (Nadzhafarov, 1967), *Trichocephalus trichiurus* (Alakhverdyanz & Zakharova, 1961), protozoan *Bodo caudata*, *Entamoeba histolytica* (Trofimov & Engelgart, 1965), and bacterial pathogens: *Aerobacter aerogenes*, *Bacillus megaterium*, *Diplococcus pneumoniae*, *Proteus rettgeri*, *P. vulgaris* (Greenberg, 1971), *Escherichia coli* (Greenberg, 1971; Shura-Bura, 1952; Shura-Bura & Gaydukova, 1975), *E. intermedia*, *Salmonella enteritidis*, *S. paratyphi* "A" and "B", *S. typhi* (Greenberg, 1971), *Shigella dysenteriae* (Greenberg, 1971; Sychevskaya et al., 1959), and polioviruses (Bang & Glaser, 1943; Greenberg, 1971).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, 19.08.1988, 1 ♂ (S. Zrazhewsky); 3.06.2003, 1 ♂; Uman City: "Sofiivka" dendrological park, 11.06.2005 & 13-14.06.2006, 5 ♂. Chernigiv Region: Ichnya District: "Trostyanyet" dendrological park, meadows and forest at lake coast, 5-11.08.1999, 5 ♂. Crimea: Bakhchysaray District: Beregoe, loam sea shores and sandy area, 14-16.08.1996, 1 ♂; 15-25.08.2001, 8 ♂, 1 ♀; 4-11.08.2004, 8 ♂, 1 ♀; Lenino District: Qazan Tip State Reserve, 17-23.07.2007, 7 ♂; Simferopol, 27.08.2004, 1 ♂. Kyiv City: Dnipro District: Moscow bridge, 2 km N, island on Dnipro, 30.05. & 29.08.2008, 3 ♂. Hosiiv District: "Didorovsky" pond, humid banks, 11.07-9.08.2002, 1 ♂; Hosiiv Park in memory Maxym Rylsky, 10.06.2009, 1 ♂; "Feofania" park, dry forest near pond, 28.07.2002, 1 ♂; Kozacha street, on leaves and walls, 7.07.2005, 1 ♂; Sovky hole, coast of pond, humid meadow, 29.09.2002, 1 ♂; Kozachy I. at Dnipro, 12 km S of Kharkiv Bridge, 9.09.2009, 1 ♂; Olzhyn I. at Dnipro, 10 km S of Kharkiv Bridge, 16.09.2009, 5 ♂. (Yu. Verves); Uralska street, 3-6.07.2009, 2 ♂, 1 ♀ (A. Drozdovska); Vasylkivska street 33, yard, 25.06. - 5.07.2008 & 18.05.-5.10.09.2009, 27 ♂, 1 ♀; Vasylkivska street 98, yard, 2.05.-30.09.2002, 27 ♂, 2 ♀; Baykove Cementery, 13.07., 30.09.2003 & 16.08.2004, 4 ♂, 2 ♀; Obolon District: unnamed island on Dnipro river, N 50°30'25", E 30°31'16", 26.05.2011, 4 ♂, 1 ♀; Verbne Lake, 31.08.2004, 3 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 1 ♂; Podil District: Shevchanko

square, humid meadow nr pond, 15.07.2005 & 27.09.2006, 8 ♂, 1 ♀; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 10 ♂. Kyiv Region: Boryspil District: Rozhny village, bushes at coast of Dnipro, 15-17.08.1999, 2 ♂; Kyiv-Svyatoshyn District: Moshchun village, humid meadows near forest stream, 8.09.2003, 1 ♂¹²; Obukhiv District: Ukrainka City: coast of Dnipro, dry meadow and bushes, 14.09.2003, 1 ♂; Velyki Dmytrovychi village, ground road, 10.07.1999, 1 ♂; (Yu. Verves); Skvyra District: Pustovarivka village, 26-27.06.2004, 1 ♂ (A. Drozdovska). Luhansk Region: Stanychno-Luhanska District: environs of Nova Kindrashivka village, sandy area, 1.08.2008, 1 ♂; Sverdlovsk District: Provallya village, 27-29.07.2008, 1 ♂ (A. Drozdovska). Mykolaiv Region: Ochakiv District: Kinburn sandy area, 16.05.2003, 2 ♂, 2 ♀ (Yu. Protzenko). Odesa Region: Ismail City, 4-8.08.2009, 1 ♂, 1 ♀ (V. Corobchyshyn). Poltava Region: Pyryatyn District: Keybalivka village, meadows near Uday river, 14.07.2009, 1 ♂. Sumy Region: Romny City, 25.08.2009, 1 ♂. Zaporizzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 1 ♂; meadows and bushes, 4-15.06.2008, 13 ♂; Berdyansk City, sandy spit at Azov Sea, 14-17.08.1994, 2 ♂; Melitopol City: “Kamyany Mogyly” Reserve, at stones, 28.08.1997, 3 ♂; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 11-26.08.1997, 13 ♂ (Yu. Verves).

67. *Liopygia (Jantia) crassipalpis* (Macquart, 1839)

Distribution: Palaearctic: Europe: AL, AT, BG, CZ (Moravia), DE, ES, FR (mainland and Corsica), GR, HR, HU, IT (mainland, Sardinia and Sicily), MD, MK, MNE, MT, PT, RO, RS, RU (Astrakhan and Voronezh Regions), SK, TR, UA; North Africa: DZ, EG, ES (Canary Is.), LY, MA, PT (Azores and Madeira), TN; Asia: AF, AM, AZ, CN (Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shaanxi, Shandong, Shanghai, Sichuan, Tianjin, Xinjiang), CY, EG (Sinai), Gaza Strip, GE, IL, IR, IQ, JP (Hokkaido, Honshu, Shikoku), KG, KP, KR, KZ, LB, MN, PA, RU (Alania, Altai, Bashkortostan, Buryatia, Chechnya, Chita, Dagestan, Krasnodar, Novosibirsk and Primorye Regions), SA, Tibet, TJ, TM, TR, UZ. Nearctic: CA (British Columbia and Quebec), GL¹³, US (California, Connecticut, District Columbia Florida, GE, Illinois, Massachusetts, New York, North Carolina, Pennsylvania and Philadelphia). Afrotropical: ZA (Eastern Cape and Gauteng). Oriental: CN (Zhejiang), PK (Sind). Australasian/Oceanian: AU (Capital Territory, New South Wales, Queensland, South AU, Victoria, Western AU), MH, NZ (South I.), PF (Society Is.), PG (New Guinea), US (Hawaii). Neotropical: “Caribbean, Central and South America” (Diaz & Kaufman, 2011): AR (Buenos-Aires City and Province), BR (Rio Grande do Sul) CL, UY. UA: Cherkasy, Crimea, Dnipropetrovsk, Donetsk, Kharkiv, Kherson, Kyiv, Luhans’k, Mykolaiv, Odesa*, Poltava and Zaporizzhya Regions.

Larvae of this eusynanthropic species are generally necrophagous (Mulieri et al., 2010; Otranto & Stewens, 2002; Povolný & Verves, 1990, 1997; Rohdendorf, 1937; Stackelberg, 1956; Zakharova, 1961, 1965) and bred in rotten meat (Artamonov, 1983; Stackelberg, 1956), human remains (Castillo Mirables, 2002; Martínez-Sánchez et al., 2006; Meiklejohn, 2012), dead animals (Mulieri et al., 2010; Stackelberg, 1956): cattle (Stackelberg, 1956), mice (Lopes, 1959), rabbits (Krüger et al., 2010; Yang et al., 2010), pigs (Ma et al., 2000), locusts (Rukavishnikov, 1930), etc. This species reported as forensic indicator (Bonacci et al., 2014; Oliva, 1997; Romero et al., 2003). Maggots cause occasional traumatic and cutaneous (Ali Khan & Ali Khan, 1974; Cutrupi et al., 1986; James, 1947; Lukin, 1989a, b; Ravasan et al., 2012; Sevgili et al., 2004a; Zumpt, 1965), nosocomial (Magnarelli & Andreadis, 1981) aural (Morris, 1987), intestinal (Nagakura et al. 1984; Shiota et al., 1990) and ophthalmomyiasis (Uni et al. 1999) of humans; wound myiasis in reptilian host *Uromastix hardwicki* (Ali Khan & Ali Khan, 1974) and mammals: cattle, dogs, gazelle, pigs, sheep (Sevgili et al., 2004a, b; Trofimov, 1957; Zumpt, 1965). Maggots were registered as predators of eggs sucks of locusts *Schistocerca cancellata* (Silveira et al., 1958) and *S. gregaria* (Bogush, 1959), pupae of spruce budworm, *Choristoneura fumiferana* (Arthur & Coppel, 1953) and as facultative parasites of adult *Schistocerca gregaria* (Séguy, 1941). Adult flies attracted to rottown meat, corpses (Prado e Castro et al., 2010; Stackelberg, 1956), faeces and dung (Martínez-Sánchez et al., 2000b) and feed on flowers of *Anethum graveolens* (Verves, 2003) and *Condalia* spp. (Mulieri et al., 2010). Flies were collected in mountains at altitudes up to 1850 m o. s. l. (Pekbey &

¹² Postabdomen of this specimen is entirely shining-black in contrast with usual reddish-orange colour.

¹³ After Diaz & Kaufman, 2011.

Hayat, 2010). This fly has great medical and veterinary importance as a vector of disease agents helminthes eggs *Ascaris lumbricoides*, bacterial pathogens *Escherichia* spp., *Salmonella* spp., etc (Greenberg, 1971).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, 3.06.2003, 1 ♂. Crimea: Bakhchysaray City, stoned hill, 400 m o. s. l., 12.08.1996, 1 ♂; sandy area, 1.08.2004, 1 ♂. Kyiv City: Desna District: Moscow bridge, 2 km N, unnamed island on Dnipro, 30.05. & 29.08.2008, 3 ♂; Holosiiv District: Baykove Cementery, 7.08.2003, 3 ♂; “Sovky hole”, at wall of building, 15.09.2009, 1 ♂ (Yu. Verves); “Prospect Nauki” avenue, garden in yard, 26.07.2002, 1 ♂ (A. Drozdovska); Vasylykivska street 33, yard, 18.05. - 5.10.2009, 27.05. & 24-25.06.2010, 29 ♂; 4 ♀; Vasylykivska street 98, yard, 29.04.-30.09.2002, 7 ♂, 3 ♀; indoor of laboratory building, on windows, 5.09.2002, 1 ♀; Williams street, dry meadows, 12-19.08.2002, 4 ♂; Obolon District: Verbne Lake, sandy shore, 31.08.2004, 3 ♂; Obolon island, N 50°30'25", E 30°31'16", 28.04., 16.06. & 22.09.2011, 6 ♂, 1 ♀; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000 & 27.09.2006, 25 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 3 ♂. Mykolaiv Region: Ochakiv District: Parutino village, debris of antic City Olvia, 16.07.2006, 3 ♂, 1 ♀ (Yu. Verves). Odesa Region: Ismail City, 4-8.08.2009, 1 ♀ (V. Corobchysyn). Poltava Region: Grebinky District: environs of Zhovtneve village, meadows, 13.07.2009, 1 ♀. Zaporizzhya Region: Melitopol City: “Kamyany Mogyly” Reserve, at stones, 28.08.1997, 5 ♂; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 10-26.08.1997, 11 ♂, 2 ♀ (Yu. Verves).

68. *Liopygia (Thomsonea) argyrostoma* (Robineau-Desvoidy, 1830)

Distribution: Palaearctic: Europe: AL, AT, BA, BE, BG, BY, CH, CZ (Moravia), DE, DK, ES (mainland and Balearic Is.), FR (mainland), GI, GR, HR, HU, IT (mainland, Sardinia and Sicily), MD, MK, MNE, NL, PL, PT, RO, RS, RU (Bashkortostan, Moscow, Ryazan and Voronezh Regions), SE, SI, SK, TR, UA, UK (England); North Africa: DZ, EG, ES (Canary Is.), PT (Azores and Madeira), TN; Asia: AF, AM, AZ, CN (Qinghai), CY, EG (Sinai), Gaza Strip, GE, IL, IQ, IR, KG, KZ, MN, PA, RU (Alania, Amur, Chechnya, Dagestan, Khabarovsk and Primorye Regions), SA, SY, TJ, TM, TR. Nearctic: BM, CA (Quebec), US (California, INna, Iowa, Missouri, New York, North Carolina, Pennsylvania and Texas). Afrotropical: SH, ZA (Western Cape). Oriental: IN (Gujarat, Haryana, Rajastan, Uttar Pradesh); PK (Kalash Walley and Punjab). Australasian/Oceanian: MH (including Wake I.), US (Hawaii). Neotropical: AR (Buenos Aires City and Province), BR (Rio Grande do Sul), CL, CU. UA: Cherkasy, Chernigiv, Chernivtsi, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Kirovograd, Crimea, Kyiv, Luhansk, Mykolaiv, Odesa, Poltava, Sumy*, Vinnytsia, Zakarpattya and Zaporizzhya Regions.

This subcosmopolitan species is regarded as eusynanthropic (Povolný & Znojil, 1989) *r*-strategist (El-Shazly et al., 1995). Larvae mainly necrophagous and reared from rotten meat (Aldrich, 1916; Grassberger & Reiter, 2002; Mulieri et al., 2010; Rohdendorf, 1937; Salwa & Abdel-Rahman, 1983; Zakharova, 1965), decaying fish (Artamonov, 1987), corpses of humans and other vertebrates (Denno & Cothran, 1975; Grassberger & Frank, 2004; Romero et al., 2003), rarely in human (Sychevskaya, 1972) and cat faeces (Kühlhorn, 1986), poultry droppings (Yates, 1967), dead or dying snails (Grassberger & Reiter, 2002; Groth & Reissmüller, 1973), eggpods and adult locusts: *Dociostaurus maroccanus* (Künckel, 1905), *Locusta migratoria* (Rohdendorf, 1937), *Schistocerca gregaria* (Künckel, 1905), *S. paranensis* (Blanchard, 1933); scarabaeid beetles: larvae of *Melolontha hippocastani* (Rohdendorf, 1937), adults of *Lachnosterna* sp. (Aldrich, 1916), *Onconotus* sp. (Rohdendorf, 1937), imago of cerambycid beetle *Aelostes sorta* (Povolný & Verves, 1997), pupae of lepidopteran *Lymantria monacha* (Baer, 1921), and bred from egg nests of loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) sea turtle (McGovan et al., 2001). This species reared in the laboratory on beef and bred from a dead mole; ♀ larviposited on the second substrate while still outdoors (Richet et al., 2011). There are several records of causing wound (Burgess & Spraggs 1992; Guimarães et al., 1983; James, 1947; Mazza & Basso, 1939; Otranto & Stewens, 2002; Ravasan et al., 2012; Saccà, 1945; Sevgili et al., 2004b), aural (Fawzy, 1991), vaginal (Aspöck & Leodolter, 1970) and intestinal (Töld, 1913) human myiasis and wound myiasis of sheep (Baranov & Jezic, 1928; Otranto & Stewens, 2002; Trofimov, 1957; Zumpt, 1965). Several authors (Cherix et al., 2012; Desmyter & Gosselin, 2009; Leclercq, 1976; Martínez-Sánchez et al.,

2006 a, b; Mohamed Aly & Wen, 2013; Mohamed Aly et al., 2013a, b; Oliva, 1997; Romero et al., 2003) reported this species as an important forensic indicator. Maggots attack other dipterous larvae in faeces (Richet et al., 2011). Puparia are developed in soil (Stackelberg, 1956), sometimes in bird nests: *Columba* sp. (Woodroffe, 1953), *Passer montanus* (Draber-Moňko, 1997), *Troglodytes aegon* (Eicher, 1937; McAtee, 1927). Flies prefer outdoor (Benecke, 1998; Mulieri et al., 2011; Stackelberg, 1956), and occasionally indoor (Aradi & Mihályi, 1971), urban locations, but often were observed in more or less outstanding places: foothills (Aivazova & Safonova, 1973), suburban gardens (Allen, 1966), deserts (Charykuliev, 1965), pineapple growing section (Illingworth, 1928), limestone territories, lowland flood-plain forests (Kejval, 1998), grasslands (Mulieri et al., 2008) and bushes (Nandi, 2002) at altitudes up to 2000 m o. s. l. (Pekbey & Hayat, 2010; Sychevskaya, 1972). Adults are attracted to fresh and rotten meat, carcasses, faeces, destroyed fruits, flowering plants (Akbarzadeh et al., 2012; Povolný & Verves, 1990, 1997; Prado e Castro et al., 2011; Richet et al., 2011; Stackelberg, 1956; Sychevskaya, 1972; Verves & Khrokalo, 2006). Flies are transmitters of bacterial agents *Escherichia coli*, *Mycobacterium leprae*, *M. phlei*, *M. tuberculosis*, *Neisseria catarrhalis* (Greenberg, 1971), and eggs of helminthes *Ascaris lumbricoides* and *Hymenolepis nana* (Verves & Khrokalo, 2006). Larvae were allowed to feed on *Trichinella spiralis*-infected mouse meat and may be its paratenic host (Maroli & Pozio, 2000).

Material examined: Cherkasy Region: Uman City: Dendrological park "Sofiivka" 11.06.2005, 2 ♂, 1 ♀. Chernigiv Region: Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 12-13.08.1999, 2 ♂. Crimea: Bakhchisaray District: Beregove village, sandy area, 11-13.08.1996, 1 ♂; Lenino District: Qazan Tip State Reserve, 19.07.2007, 1 ♂ (Yu. Verves); Theodosia Municipal Government: Karadagh Natural Reserve, 10-13.07.2006, 1 ♂ (A. Drozdovska). Kyiv City: Holosiiv District: Vasylykivska 33, yard, 28.07., 5.10.2009 & 5.05.2010, 5 ♂, 2 ♀; Vasylykivska street 98, yard, 29.04.-28.07.2002, 3 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 2 ♂; Podil District: Shevchenko square, humid meadow nr pond, 15.07.2005 & 27.09.2006, 2 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 1 ♂ (Yu. Verves). Odesa Region: Ismail City, 4-8.08.2009, 4 ♀ (V. Corobchysyn); Odesa City, indoor, 15.10.1983, 1 ♀ (N. Berezovsky). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13 and 15.08.2010, 1 ♂; Pyryatyn District: Bilotzerkivtzi village, locality Murentzeve, 15.08.2010, 1 ♂; Keybalivka village, meadows at bank of Uday river, 11.07.2009, 1 ♂, 1 ♀; Lelyaky village, meadows at bank of Uday river, 12.08.2010, 1 ♂ (A. Drozdovska, O. Tkachenko). Sumy Region: Romny City: banks of Romenka river, meadows and bushes, 21-27.08.2009, 3 ♂. Zaporizzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 2 ♂; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 10-11.08.1997, 3 ♂ (Yu. Verves).

69. *Liopygia (Varirosellea) uliginosa* (Kramer, 1908)

Distribution: Palaearctic: Europe: AT, BG, BY, CZ (Bohemia and Moravia), DE, ES, HR, FR (mainland), GR, DK, HU, IT (mainland and Sardinia), MD, MK, PL, RO, RS, RU (Bashkortostan, Belgorod, Ekaterinburg, Karelia, Leningrad, Nizhny Novgorod, Orenburg, Penza, Saratov and Voronezh Regions), SK, UA, UK (England); Asia: AM, AZ, CN (Heilongjiang, Jilin, Liaoning, Ningxia, Shanxi), GE, JP (Hokkaido, Honshu), KP, KR, KZ, MN, RU (Altai, Amur, Chelyabinsk, Dagestan, Irkutsk, Khabarovsk, Krasnodar, Novosibirsk, Primorye, Sakhalin I. and Tuva Regions), TJ. Nearctic: CA (Ontario), US (Massachusetts). UA: Cherkasy, Kyiv, Luhansk and Zakarpattya Regions.

Larvae are obligatory predators of lepidopteran pupae, rarely prepupae: *Aporia crataegi* (Artamonov, 1985; Kolomyietz, 1966), *Cosmotriche potatoria* (Zinovyev, 1962), *Dasychira albodentata* (Nakonechny et al., 1973; Zinovyev, 1962), *Dendrolimus pini* (Baer, 1921; Herting & Simmonds, 1976; Khitzova, 1976; Kolomyietz, 1989; Povolný, 1988), *D. sibiricus* (Girfanova & Idrisova, 1977; Kolomyietz, 1952, 1958, 1962; Stepanova et al., 1977; Zinovyev, 1962), *D. spectabilis* (Verves & Khrokalo, 2006), *Euproctis chrysorrhoea* (Grunin, 1954; Herting & Simmonds, 1976; Wyatt & Sterling, 1988), *Euxoa segetum* (Bilanovsky, 1931; Herting & Simmonds, 1976; Povolný, 1988), *Leucoma candida* (Artamonov, 1985), *Lymantria dispar* (Baranov, 1942; Belov & Panina, 1985; Čápek & Čepelák, 1970; Girfanova, 1957; Herting & Simmonds, 1976; Hoch et al., 2001; Khanislamov et al., 1958; Kolomyietz, 1958, 1966, 1987; Nakonechny, 1973a; Povolný, 1988; Shapiro, 1956; Stepanova et al., 1977; Tabakovic-Tosic et al., 2013), *L. monacha* (Herting &

Simmonds, 1976; Kolomyietz, 1958; Kramer, 1908; Nakonechny, 1973b; Povolný, 1988; Stepanova et al., 1977; Tereshkin, 1991; Tereshkin & Lobodenko, 1997), *Porthesia similis* (Kolomyietz, 1962, 1966), *Malacosoma neustria* (Bilanovsky, 1931; Draber-Moňko, 1973; Drensky, 1957; Stepanova et al., 1977), *Orgyia antiqua* (Herting & Simmonds, 1976; Kolomyietz, 1958; Nakonechny, 1973a), *Selenephra lunigera* (Nakonechny, 1973a), *Stilpnotia salicis* (Kolomyietz, 1958; Stepanova et al., 1977; Yafaeva, 1977), *Vanessa xanthomelas* (Kolomyietz, 1966). This species disappears gradually from large areas in Central Europe being restricted to limited habitats (Povolný & Verves, 1990). Imagoes schizophagous (Artamonov, 1988); feed at flowering plants, *Melilotus albus* (Khitzova, 1976), etc.

Material examined: Kyiv City: Vasylykivska street 98, yard, at leaves, 18.06.2002, 1 ♂ (Yu. Verves).

70. *Liosarcophaga* (s. str.) *dux* (Thomson, 1869)

Distribution: Palaearctic: Europe: AL, BA, BG, FR (mainland and Corsica), FRU (Voivodina), GR, HU, HR, IT (mainland, Sardinia and Sicily), MK, MNE, MT, RKS, RO, RS, ES (mainland, Balearic Is. and Columbretes Is.), UA; North Africa: ES (Canary Is.), EG, LY, MA, PT (Azores), TN; Asia: AZ, CN (Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jangsu, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shanxi, Shaanxi, Shandong, Shanghai, Shanxi, Sichuan, Xinjiang), CY, EG (Sinai), GE, IL, JP (Honshu, Kyushu, Shikoku and Minami-Iwojima Is.), KP, KR, KZ, PA, RU (Dagestan and Krasnodar Regions), SA, Tibet, TM, TR, UZ. Afrotropical: CV. Oriental: BD, BT, CN (Fujian, Guangdong, Guangxi, Guizhou, Hainan I., Hunan, Jiangxi, Yunnan and Zhejiang); IN (Andaman Is., Andra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Dehli, Goa, Gujarat, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal), ID (Flores, Java, Kalimantan, Lombok, Sulawesi, Sumatra and Timor); JP (Ryukyu Is.); LK, MM, MY (Kelanmtan, Kuala Lumpur, Penang, Sarawak, Selangor, and Terengganu), NP, PH (Balabac, Palawan), PK (Peshawar), SG, TH (Chiang Mai, Chiang Rai, Chon Buri, Lampang, Nan, Surat Thani, Tak and Ubon Ratchathani Provinces), TW. Australasian/Oceanian: AU (Capital Territory, Lord Howe I., New South Wales, Northern Territory, Queensland, South AU, Tasmania, Victoria, and Western AU), CX, FJ, FM (Caroline Is.: Asor, Falalop, Ifaluk, Kapingamarangi, Kusaie, Lamotrek, Ponape, Satawal, Ulithi; Truk Is.: Dublon, Feran, Ton, Pata, Wena; Yap Is.: Map, Yap), GU (Bonin Is.: Chichi Jima, Haha Jima, Muko Jima), ID (Irian Jaya, and Moluccas: Ambon, Ceram), JP (Kazan Is., Ryukyu Is.), KI (Gilbert Is.: Abemama, Onotoa, Tarawa), MH (Eniwetok, Jemo, Kwajalein, Majuro, Namorik, Ujae, Ujelang, Wake, Wotje), US (Hawaii: Canton, Hawaii, Kauai, Lanai, Maui, Midway, Molokai, Oahu; Marianas: Agiguan, Agrihan, Anatahan, Rota, Saipan, Tinian), PG (Dyaul, Lavongai, New Britain; Manus I.; New Guinea); PN, PW (Angaur, Babelthuap, Koror, Ngarmalk, Ngerkabesang, Ngesebus, Ngurukdabel, Peleliu, Ulebsehel); SB, WS. UA: Crimea.

This species normally breeds in vertebrate carrion (Ameen & Huq, 1973; Hall & Bohart, 1948; James, 1947; Kano et al., 1967; Park, 1977; Senior-White et al., 1940), dead insects (Callan, 1937; Nandi, 2002; Olsoufjev, 1929; Rukavishnikov, 1930) and land snails (Beaver, 1986; Bohart & Gressitt, 1951; Buxton, 1929; Senior-White et al., 1940), garbage (Wilton, 1961), in human faeces (Bohart & Gressitt, 1951; Ishijima, 1967; Trofimov, 1969), cow (Chin et al., 2010) and horse (Hardy, 1943) dung, rotten vegetable (*Cajanus indicus*) and cucumber (Lopes, 1958; Nandi, 2002; Senior-White et al., 1940). Larvae preferred breeding material in garbage dumps (Aloke et al., 1989). Maggots from human cadavers may provide important indications of the postmortem interval during forensic entomology investigations (Guo et al., 2010a, b, 2011; Mohamed Aly & Wen, 2013; Mohamed Aly et al., 2012, 2013a, b; Sukontason et al., 2014; Tan et al., 2010). They also caused facultative tissue myiasis in camel, bullocks, cows, goats (Alwar & Seshiah, 1958; Roy & Dasgupta, 1975; Sevgili et al., 2004b; Sinha et al., 2002). Several cases of human myiasis of wound (Senior-White et al., 1940) and eye (Nash, 2005) produced by larvae of this species are known. Maggots are facultative predators of freshwater snail *Indoplanorbis exustus* (Lomer et al., 1989; Parashar & Rao, 1989; Parashar et al., 1997) and land snail *Helix adspersa* (Povolný, 1987), pupae of lepidopteran hosts *Spodoptera litura* (Battu, 1977; Battu & Dilawari, 1978; Joshi et al., 1979), *Porthetria dispar* (Lehrer & Luciano, 1979), adult scarabaeid beetle *Polyphylla perversa* (Emden, 1950). This species reared in the laboratory on snails and chopped grasshoppers (Richet et al.,

2011). Adult flies are common in urban territories (Aloke et al., 1989), villages (Blackith & Blackith, 1988), gardens, sand beach, in mountains up to 1300 m a. s. l. (Kano et al., 1967; Kurahashi & Chaiwong, 2013; Lopes, 1958). Along sea shores this species seems to dominate the sarcophaginae associations and aggregations on small carcasses, especially fish, crustaceans and mollusks (Povolný & Verves, 1990). Such six different ecological habitats were selected for *L. dux*: botanical garden, lake-area, administration building, wetland, jungle fringes and housing areas (Nazni et al., 2007). Adults feed at dead fish (Aloke et al., 1989), flowers of *Bulbophyllum putidum*, *Tectona grandis*, and fallen fruits of *Dimocarpus longan*; larviposited on human faeces and carrion (Bänziger & Pape, 2004). In India the corpses of *Bufo melanostictus* were infested after 20 hours postmortem; larvae develop 4-11 days, pupae - 8-15 days. Copulation took place on 5-7th day after hatching, and oviposition - after 7-13 days. The duration of imaginal life is 55-87 days, fertility - 50-81 larvae (Das & Dasgupta, 1986). This species has been found associated with the cause of amoebic dysentery, *Entamoeba histolytica* (Greenberg, 1971). Adult flies are carriers of nematodes *Habronema muscae* and *H. megastomum* (Hörning, 1959).

Material examined: Crimea: Bakhchysaray District: Beregove village, sandy area, 1.08.2004, 2 ♂; Lenino District: Kazan Tip State Reserve, 19-29.07.2007, 3 ♂ (Yu. Verves); Theodosia Municipal Government: Karadagh Natural Reserve, 10.07.2006, 1 ♂ (A. Drozdovska).

71. *Liosarcophaga (s. str.) emdeni* (Rohdendorf, 1969)

Distribution: Palaearctic: Europe: AL, AT, BG, CH, CZ (Bohemia and Moravia), DE, DK, EE, FI, FR (mainland), HR, HU, NO, PL, RO, RU (Bashkortostan, Ivanovo, Leningrad, Lipetsk, Moscow and Voronezh Regions), SE, SK, UA, UK; Asia: AM, AZ, CN (Xinjiang), GE, KZ, RU (Altai, Chechnya, Dagestan, Irkutsk, Kemerovo, Krasnoyarsk and Tuva Regions), TR. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Ivano-Frankivsk, Kherson, Khmelnytsky, Kyiv, Lviv, Mykoliyiv, Odesa, Poltava, Rivne, Ternopil, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are necrophagous (Girfanova, 1958), bred in destroyed meat (Trofimov, 1969) and dead insects; facultative predators of lepidopteran pupae *Lymantria dispar* (Khitzova, 1967), *L. monacha* (Khitzova, 1968), parasitoids of terrestrial gastropods *Cepaea nemoralis* (Richet, 1990) and *Xerolenta obvia* (Verves & Kuzmovich, 1979). This species accompanies to lower elevations, both lowland forests, and xeric habitats and is obviously rather thermophilic (Povolný & Verves, 1990), sea shores, wastes (Emden, 1954), not rare in synanthropic conditions (Aradi & Mihályi, 1971). Adults feed on decaying meat, faeces, rotten fruits, flowers of different plants from families Apiaceae, Asteraceae, Euphorbiaceae (Verves & Kuzmovich, 1979), especially *Solidago canadensis* (Verves, 2013).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 20.05.2003, 1 ♂; *ibid.*, sandy coast of Dnipro, 2.06.2003, 1 ♂; *ibid.*, Zmiyini Is., Coast of Kaniv lake, 23.05.2003, 1 ♂. Chernigiv Region: Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 8-11.08.1999, 4 ♂. Crimea: Bakhchysaray District: Beregove, loam sea shores, 23.08.1996, 1 ♂; *ibid.*, sandy area, 7-8.08.2004, 3 ♂; Bakhchysaray City, stoned hill, 400 m a. s. l., 12.08.1996, 1 ♂; Lenino District: Qazan Tip State Reserve, 23-29.07.2007, 8 ♂ (Yu. Verves); Theodosia Municipal Government: Karadagh Natural Reserve, 2.07.2006, 2 ♂ (A. Drozdovska). Kherson Region: Gola Prystan District: Chornomorsky Biosphere Reserve, Rybalchasnskiy branch, 28.05.1978, 1 ♂; Solenoozerny branch, 28.05.1978, 17-21.09.2003, & 28.07.2006, 6 ♂ (N. Berezovsky, Yu. Protzenko, Yu. Verves); Vinogradovo village, coast of Dnipro, 25.07.2006, 1 ♂. Kyiv City: Dnipro District: Hydropark, bushes, 16.06.2010, 1 ♂; Holosiiv District: Baykove Cementery, 13.07. and 24.09.2003, 2 ♂; "Didorovsky" pond, humid banks, 28.08-5.09.1999, 2 ♂; Holosiiv Park in memory Maxym Rylsky, 10.06.2009, 2 ♂; Kozachy I. at Dnipro, 12 km S of centre of Kyiv, 9.09.2009, 2 ♂; National Exhibition Centre, bushes, 27.08.1999, 1 ♂; "Pyrogiv" field museum, 24.08.1999 & 28.05.2000, 10 ♂; "Theophania" park, 11-19.06.2013, 4 ♂; Vasylkivska street 33, yard, 23.06. & 18.07.2008, 2 ♂; Vasylkivska street 98, yard, 15.05.-2.08.2002, 5 ♂; Williams street, dry meadows, 12-19.08.2002, 4 ♂. Obolon district: island on Dnipro, N 50°30'25", E 30°31'16", 16.06.2011, 1 ♂. Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000, 15.07.2005 & 27.09.2006, 8 ♂. Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 1 ♂. Kyiv Region: Obukhiv District: Velyki

Dmytrovychi village, grass coast of stream, 4.07.1994, 8.09.1995, 27.06.1997 & 4.07.1999, 11 ♂ (Yu. Verves). Odesa Region: Ismail District: Suvorove village, 21.05.2003, 2 ♂ (Yu. Protzenko). Poltava Region: Pyryatyn District: Shkuraty village, locality "Ostriv", sandy road, 15.08.2010, 1 ♂. Zakarpattia Region: Uzhgorod District: Nyzhne Solotvyno village, meadow & beech forest, 98°33'N, 22°26'E, 140-200 m a. s. l., 16-23.08.2014, 10 ♂. Zaporizhzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 8 ♂ (Yu. Verves).

72. *Liosarcophaga* (s. str.) *harpax* (Pandellé, 1896)¹⁴

Distribution: Palaearctic: Europe: AT, BG, BY, CZ (Bohemia and Moravia), DE, FR (mainland), HR, HU, MD, PL, RO, RS, RU (Bashkortostan, Belgorod, Bryansk, Ivanovo, Jewish Autonomy, Kaliningrad, Leningrad, Moscow, Penza, Ryazan, Saratov and Voronezh Regions), SK, NL, UA; Asia: AZ, CN (Gansu, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan and Xinjiang), GE, JP (Hokkaido, Honshu, Kyushu and Shikoku), KZ, KP, KR, MN, RU (Altai, Amur, Buryatia, Chita, Dagestan, Khabarovsk, Novosibirsk, Primorye, Sakhalin, Tomsk and Tuva Regions), SA, TJ. Oriental: BD (Dacca), IN (Andra Pradesh, Bihar, Orissa, Uttar Pradesh, West Bengal), LK. UA: Cherkasy, Chernigiv, Chernivtsi, Ivano-Frankivsk, Kherson, Kyiv, Poltava and Zakarpattia Regions.

Larvae are bred from dead grasshoppers, fish, serpentes, birds, mammals (Artamonov, 1988; Kano et al., 1967; Nandi, 2002) and known as facultative predators of lepidopteran pupae *Aporia crataegi* (Artamonov, 1985), *Cosmotriche potatoaria* (Zinovyev, 1962), *Dasychira albodentata* (Nakonechny et al., 1973; Zinovyev, 1962), *Dendrolimus pini* (Draber-Moňko, 1973; Entin, 1971; Khitzova, 1968; Shapiro, 1956; Sierpińska, 1998; Yarmanshevich, 1970), *D. sibiricus* (Kolomyietz, 1958, 1966; Zinovyev, 1962), *D. spectabilis* (Kano & Kokubo, 1962), *Dictyoploca japonica* (Artamonov, 1978), *Lymantria dispar* (Artamonov, 1985; Belov & Panina, 1985; Girfanova, 1957, 1962; Khanislamov et al., 1958; Khitzova, 1967, 1968; Kolybin & Zelinskaya, 1971; Logoida, 1978; Parker, 1919; Ryvkin, 1958; Shapiro, 1956; Stepanova et al., 1977; Tabakovic-Tosic et al., 2013), *L. monacha* (Kolomyietz, 1958; Ryvkin, 1958), *Stilpnolia salicis* (Kolomyietz, 1966; Shapiro, 1956), able to predate another fly maggots in animal carcasses (Povolný & Verves, 1997) and to produce human otomyiasis (Kaneko et al., 1968) and mammal tissue myiasis (James, 1947). The presence of maggots in human remains is important for forensic investigations (Kim et al., 2014). Females are larviposit on the surface of lepidopteran pupae or on leaves at distance to several millimeters from pupa (Artamonov, 1985). This culturophilous species accompanies forest stands up to their submontane elevations, bushes, gardens, synanthropic habitats (Povolný & Verves, 1990; Verves & Khrokalo, 2006). Flies are attracted to *Aristolochia ridicula* flowers and also to almost all decaying substances (Senior-White et al., 1940); feed at flowering plants, aphid excreta, rotten fruits, corpses and faeces (Verves & Khrokalo, 2006).

Material examined: Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 11.06. and 8-11.07.2000, 3 ♂; Ichnya District: "Trostyanyet" dendrological park, meadows and forest at lake coast, 5-9.08.1999, 3 ♂. Kyiv City: Desna District: "Druzhby Narodiv" park, meadows nr lake, 8.07.2005, 1 ♂. Kyiv Region: Vyshgorod District: Osishchyna village, meadows nr lake, 3.06.2007, 1 ♂ (Yu. Verves).

73. *Liosarcophaga* (s. str.) *jacobsoni* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: AL, BG, DE, DK, ES, FR (mainland and Corsica), GR, HR, HU, IE, IT (mainland and Sardinia), MD, MNE, RO, RS, RU (Bashkortostan and Voronezh Regions), SK, UA, UK; North Africa: DZ, ES (Canary Is. and Spanish North Africa), MA, PT (Azores); Asia: AM, AZ, CN (Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan and Xinjiang), CY, EG (Sinai), GE, IL, IR, KP, KR, KZ, MN, RU (Dagestan and Primorye Regions), SA, Tibet, TJ, TR, TM, UZ. UA: Cherkasy, Crimea, Dnipropetrovsk, Kharkiv, Kherson, Kirovograd, Kyiv, Mykolaiv, Odesa and Zaporizhzhya Regions.

¹⁴ Wangko et al. (2014) reported this species from Sulawesi, Indonesia. This record really is applied to *Liosarcophaga* (s. str.) *kohla* (Johnson et Hardy, 1923).

Larvae are bred from human and animal faeces, rarely from dead insects and vertebrates (Artamonov, 1987; Drensky, 1957; Gudjabidze, 1970; Rohdendorf, 1937) and predatory of dipterous maggots in faeces (Povolný & Verves, 1990, 1997); bred from living snail *Cepaea nemoralis* (Richet, 1990); reared in laboratory conditions on freshly killed snails and chopped insects (Richet et al., 2011). Adult flies prefer dry steppe and sandy habitats, gardens and vegetable gardens, common in synanthropic conditions, where visiting flood markets (Aradi & Mihályi, 1971; Trofimov, 1969). Flies in settlements indoor up to 800 m o. s. l. (Vaschinskaya, 1959); are attracted to animal carcasses (Castillo Mirables, 2002), cattle dung and faeces (Martínez-Sánchez et al., 2000), aphid excreta, rotten fruits etc. (Verves & Khrokalo, 2006). In rectum and mid-gut of imago such pathogenic organisms have been found: *Bodo caudata*; cysts of *Lamblia intestinalis*; vegetative cells of *Lamblia canis* and *Herpetomonas muscorum* (Trofimov & Engelhardt, 1965).

Material examined: Crimea: Lenino District: Qazan Tip State Reserve, 24-29.07.2007, 5 ♂. Zaporizhzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 1 ♂ Berdyansk City: sandy spit at Azov Sea, 14-17.08.1994, 1 ♂; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 10-26.08.1997, 41 ♂ (Yu. Verves).

74. *Liosarcophaga (s. str.) parkeri* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: AL, BG, CZ (Moravia), EE, ES, FR (mainland), HU, IT (mainland), MD, RO, RS, RU (Voronezh Region), SK, UA; North Africa: EG, PT (Azores); Asia: AM, AZ, CN (Gansu, Ningxia and Xinjiang), EG (Sinai), GE, IL, IR, KZ, PA, RU (Dagestan), SA, TJ, TM. Oriental: PK. UA: Cherkasy, Crimea, Dnipropetrovsk, Donetsk, Kharkiv, Kherson, Kirovograd, Kyiv, Luhansk, Mykolaiv, Odesa, Poltava, Vinnytsia* and Zaporizhzhya Regions.

Larvae develop in dead insects, more often locusts, and vertebrates, especially small animal carcasses, pig and human faeces in natural localities (Drensky, 1957; Richet et al., 2011; Rohdendorf, 1937; Saloña-Bordas & Goñales-Mora, 2005; Trofimov, 1965, 1969; Zakharova, 1961), and on pig kidney in laboratory conditions (Saloña-Bordas et al., 2007); known as facultative predators of others muscoid larvae in faeces (Richet et al., 2011), parasitoids of adults of tenebrionid beetle *Pisterotarsa gigantea zoubkoffi* and scarabaeid beetle *Scarabaeus sacer* (Charykuliev & Nepesova, 1972); caused cutaneous myiasis in sheep (Trofimov, 1957). Imagoes prefer lowground xeric habitats. This thermophilous species appears to be hemisynanthropic in steppe and hemidesert zones (Trofimov, 1965), common up to 2000 m o. s. l. (Syczevskaya, 1961). The flies visit flood markets (Aradi & Mihályi, 1971), animal carcasses, faeces and offal; hemisynanthropic species (Khoobdel et al., 2013; Povolný & Verves, 1990; Rohdendorf, 1959).

Material examined: Cherkasy Region: Uman City: "Sofiivka" dendrological park, 13-14.06.2006, 2 ♂. Crimea: Bakhchisaray District: Berego village, sandy area, 24.08.2001, 1 ♂; *ibid.*, 10.08.2004, 1 ♂; Lenino District: Qazan Tip State Reserve, 19-29.07.2007, 11 ♂. Kyiv City: Hosiiv District: "Didorovsky" pond, humid banks, 28.06.2004, 1 ♂; Dyky island on Dnipro, N 50°17'02", E 30°39'22" 6.10.2011, sandy area, 1 ♂, 1 ♀; "Sovky hole", coast of pond, humid meadow, 10.09.2000, 31.07.2002 & 29.08.2002, 3 ♂; Podil District: Shevchenko square, humid meadow nr pond, 15.07.2005, 1 ♂; Dnipro District: Rayduzny massive, bushes on bank of Malynivka Lake, 23.06.2005, 2 ♂; Obolon District: Moscow bridge, 2 km N, unnamed island on Dnipro, 27.06.2008, 1 ♂; unnamed island on Dnipro, N 50°30'25", E 30°31'16", 26.05., 16.06. & 22.09.2011, 19 ♂. Kyiv Region: Boryspil District: Rozhny village, bushes at coast of Dnipro, 16-18.08.1999, 6 ♂. Mykolaiv Region: Ochakiv District: Parutino village, bank of sea, 15-16.07.2006, 2 ♂. Poltava Region: Pyryatyn District: Keybalivka village, meadows at bank of Uday river, 18.08.2010, 3 ♂; Kharkivtzy village, 2 km S, locality "Velyki Solontzi", 13-14.07.09, 1 ♂. Vinnytsia Region: Chechelnyk District: "Karmelyuk's Podillya" National Nature Park, Lyubashivka village, 5.07.2013, 1 ♂ (V. Gorobchyshyn). Zaporizhzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 23.08.1997 & 15.06.2008, 2 ♂; Artemivsk District: Kyrylivka village, spit "Fedotova", sandy area, 16.08.1997, 1 ♂; Berdyansk City, sandy spit at Azov Sea, 14-17.08.1994, 3 ♂; Melitopol City: "Kamyany Mogyly" Reserve, at stones, 28.08.1997, 1 ♂; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 11-26.08.1997, 26 ♂; (Yu. Verves).

75. *Liosarcophaga (s. str.) portschinskyi* (Rohdendorf, 1937)

Distribution: Palaearctic: Europe: AD, AL, AT, BA, BE, BG, BY, CH, CZ (Moravia), DE, DK, EE, ES, FI, FR (mainland and Corsica), GR, HR, HU, IE, IT (mainland, Sardinia and Sicily), MD, MNE, MT, NL, NO, PL, PT, RO, RS, RU (Bashkortostan, Karelia, Leningrad, Moscow, Orenburg, Tambov and Voronezh Regions), SE, SK, UA, UK (England); North Africa: MA; Asia: AM, AZ, CN (Beijing, Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shaanxi, Shandong, Shanghai, Shanxi, Xinjiang), GE, KZ, MN, RU (Chelyabinsk, Chita, Dagestan, Karachay-Cherkessia, Krasnodar, Primorye, Stavropol and Tuva Regions), Tibet, TJ, TM, TR, UZ. Oriental: CN (Yunnan), PK. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Kirovograd, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Sumy, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are developed in carcasses of snails, fish, birds, animals, decaying meat, and faeces (Artamonov, 1987; Povolný & Verves, 1990, 1997; Zhang, 1982); known as facultative predators of lepidopteran pupae *Lymantria dispar* (Girfanova, 1962; Kolybin & Zelinskaya, 1971; Tabakovic-Tosic et al., 2013), parasitoids of snail *Theba pisana* (Hopkins & Baker, 1993; Povolný & Verves, 1990), adult cerambycid beetle *Aegosoma scabricornis* and katydid grasshopper *Tettigonia viridissima* (Richet et al., 2011); bred from grass snake, *Natrix natrix* (Pape, 1987); in the laboratory reared on snails killed by lawnmower. Adults concentrate in the hotter, drier areas; also present in coastal or sandy areas with warm microclimates (Richet et al., 2011). This hemisynanthropic species is common in governments, farms, steppe, dry meadows, fields and forest borders at altitudes up to 1000 m a. s. l. (Gunárová & Slamečková, 1966; Khitzova, 1967; Trofimov, 1969; Verves, 1973; Verves & Khrokalo, 2006). Adult flies are attracted to decaying meat, bread, fruits, human excrement (Aradi & Mihályi, 1971), cattle dung and faeces (Martínez-Sánchez et al., 2000), piglet carcasses (Prado e Castro et al., 2010, 2011) etc.; feed on flowers of *Peucedanum oreoselinum* and *Sorbus aucularia* (Draber-Moňko, 1973).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 7.06.2003, 1 ♂ (Yu. Verves). Chernigiv Region: Borzna District: environs of Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 10.07.-24.08.2000, 32 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 4-13.08.1999, 55 ♂ (Yu. Verves). Crimea: Lenino District: Qazan Tip State Reserve, 26-28.07.2007, 3 ♂ (Yu. Verves). Kyiv City: Holiiv District: Vasylkivska street 98, yard, 26.05.2002, 1 ♂; 10 km S of Kyiv City, Olzhyn I. at Dnipro, 16.09.2009, 1 ♂; Podil District: shores of lakes nr Shevchenko square, 27.09.2006, 1 ♂ (Yu. Verves). Kyiv Region: Boryspil District: environs of Rozhny village, bushes at coast of Dnipro, 15.08.1999, 2 ♂; Obukhiv District: environs of Velyki Dmytrovychi village, grass coast of stream, 8.09.1995, 3 ♂; 27.06.1997, 10 ♂; 3 km S of Tatzenky, 14.09.2003, at leaves and ground at border of pine forest nr lake, 2 ♂; 4 km W of Ukrainka City, 21.08.2004, at leaves and ground at border of pine forest nr lake, 1 ♂ (Yu. Verves). Rokytne District: Busheve village, N 49°39', E 30°35', open cast, 27.07.2012, 1 ♂ (Yu. Verves). Odesa Region: Ismail District: 5 km SE Kyslytzya village, 7. and 9.08.2009, 1 ♂; Suvorove village, 20-23.08.2009, 1 ♂ (V. Corobchysyn). Poltava Region: Grebinky District: environs of Marynivka village, 9.07.08, 1 ♂ (A. Drozdovska); environs of Grabarivka village, meadows near Ruda river, 15.07.2009, 5 ♂; Pyryatyn District: Shkuraty village, locality Ostriv, sandy road, 15.08.2010, 1 ♂ (Yu. Verves). Sumy Region: Romny City, banks of Romenka river, meadows and bushes, 21-27.08.2009, 11 ♂; dry meadows, at flowers of *Taraxacum officinale*, 5.05.2013, 5 ♂ (Yu. Verves). Zaporizhzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, steppe, 23.08.1997, 1 ♂; meadows and bushes, 15.06.2008, 1 ♂; environs of Melitopol, "Kamyany Mogyly" Reserve, at stones, 28.08.1997, 2 ♂ (Yu. Verves).

76. *Liosarcophaga (s. str.) tuberosa* (Pandellé, 1896).

Distribution: Palaearctic: Europe: AT, BA, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, ES, FR (mainland and Corsica), GR, HR, HU, IT (mainland and Sardinia), MK, NL, PL, RO, RS, RU (Bashkortostan, Kursk, Leningrad, Moscow, Rostov, Saratov, Voronezh and Yaroslavl Regions), SE, SK, UA, UK; Asia: AZ, CN (Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanghai, Shanxi, Sichuan, Xinjiang), GE, JP (Honshu and Kyushu), KG, KP,

KR, KZ, MN, RU (Altai, Amur, Chechnya, Dagestan, Khabarovsk, Novosibirsk, Primorye, Sakhalin, Tomsk, Tuva and Tyumen Regions), TJ, TM, TR, UZ. Oriental: CN (Guangxi and Guizhou), JP (Ryukyu Is.), PK (Utar Glacier), TW. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Kharkiv, Kherson, Kirovograd, Kyiv, Luhansk, Poltava, Sumy, Volyn and Zakarpattia Regions.

Larvae are developed in dead locusts, pork meat, corpse of jay (Artamonov, 1983); facultative predators of lepidopteran pupae *Dendrolimus pini* (Baer, 1921; Khitzova, 1968; Kramer, 1911; Sierpińska, 1998), *Lymantria dispar* (Čápek & Čepelák, 1970; Girfanova, 1957, 1962; Khanislamov et al., 1958; Khitzova, 1967; Logoida, 1978; Shapiro, 1956; Stepanova et al., 1977), *L. monacha* (Artamonov, 1985; Baer, 1921; Kramer, 1911), caused cutaneous myiasis of humans (James, 1947). The flies are attracted to corpses, faeces, rotten meat, flowers, ripe fruits, flood in open-air places, and aphid excreta (Aradi & Mihályi, 1971; Mihályi, 1966, 1969; Stackelberg, 1956; Verves & Khrokalo, 2006); prefers mesophytic and gygrophitic forests, borders of ponds and streames, accompanying especially warm deciduos, undistributed stands at lower elevations (Povolný & Verves, 1990, 1997; Verves, 2013).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 30 km N of Kaniv, 9.07.1988, 1 ♂; Kaniv State Nature Reserve, hombean forest, 2.08.1988, 1 ♂; yard, at vegetation, 20.05.2003, 1 ♂; Zmiyini Is., coast of Kaniv lake, 23.05.2003, 1 ♂ (Yu. Verves, S. Zrazhewsky). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 11.06.-24.08.2000, 18 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 5-13.08.1999, 27 ♂; Koryukivsky District: Gutyshche village, near pond, 3.07.2003, 1 ♂ (L. Khrokalo, Yu. Verves). Kyiv City: Desna District: "Lisova" subway-station, 5 km E, mixed forest and bushes near lake Lisove, 20.07.2004, 1 ♂; Dnipro District: "Hydropark" I. on Dnipro, Berizka lake, coast, at leves, 22.06.2006, 1 ♂; Holosiiv District: Baykove Cementery, 7.08.2003, 1 ♂; "Didorovsky" pond, humid banks, 4.09.1999, 11.07-9.08.2002, 28.06.2004 & 12.09.2005, 16 ♂; Kozachy I. on Dnipro, 12 km S of Kyiv City, 9.09.2009, 1 ♂; Olzhyn I. at Dnipro, 10 km S of Kyiv City, 25.06., 8.07. & 16.09.2009, 7 ♂; "Prospect Nauki" avenue, "Lysa Gora" hills, bushes, 26.07.2002 & 8.05.2003, 2 ♂; "Sovky hole" coast of pond, humid meadow, 10.09.2000, 29.08.2002, 27.08.2004 & 9.06.2011, 6 ♂; "Theophania" park, 19.06. & 29.07.2013, 2 ♂; Vasylkivska street 33, yard, 31.07.2009, 1 ♂; Vasylkivska street 98, yard, 22.07.2002, 1 ♂; Williams street, dry meadows, 19.08.2002, 1 ♂; Obolon district: Moscow bridge, 2 km N, unnamed island on Dnipro, N 50°30'25", E 30°31'16", 26-30.05., 16.06., 29.08.2008 & 22.09.2011, 7 ♂; Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 1 ♂; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000 & 15.07.2005, 4 ♂. Kyiv Region: Bila Tzerkva City: "Oleksandriya" park, 3.05.2009, 1 ♂; Boryspil District: Rozhny village, bushes at coast of Dnipro, 16-22.08.1999, 15 ♂; Brovary District: Zazymya village, 5 km N, meadows near Desna, 1.08.2001, 20 ♂; Kyiv-Svyatoshyn District: Gostomel village, 4 km N, meadows at right bank of Irpin river, 8.07.2001, 7 ♂; Zhukiv Island 20 km S of Kyiv, 9.09.2002, 1 ♂; Obukhiv District: Velyki Dmytrovychi village, grass coast of stream, 4.07.1994, 27.06.1997 & 4.07.1999, 3 ♂; Ukrainka City, dry meadow and bushes, 14.09.2003, 1 ♂ (Yu. Verves). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13-15.08.2010, 2 ♂; Pyryatyn District: Bilotzerkivtzi village, locality "Murentzeve", 15.08.2010, 2 ♂; Grabarivka village, meadows nr Ruda river, 15.07.2009, 13 ♂; Keybalivka village, meadows near Uday river, 17.07.2009 & 18.08.2010, 5 ♂; Kharkivtzy village, 2 km S, locality "Velyki Solontzi", 13-14.07.09, 1 ♂; Lelyaky village, meadows at bank of Uday river, 12. & 16.08.2010, 6 ♂; Masalske village, meadows nr Uday river, 14.08.2010, 10 ♂; (O. Tkachenko, Yu. Verves). Sumy Region: Romny City: banks of Romenka river, meadows and bushes, 21-27.08.2009, 19 ♂ (Yu. Verves).

77. *Liosarcophaga (Pandelleisca) similis* (Meade, 1876)

Distribution: Palaearctic: Europe: AL, AT, BA, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, FI, FR (mainland), HR, HU, IT (mainland), LV, MD, MNE, NL, NO, PL, PT, RO, RS, RU (Bashkortostan, Ivanovo, Karelia, Leningrad, Moscow, Murmansk and Voronezh Regions), SE, SK, UA, UK; North Africa: PT (Azores); Asia: AZ, CN (Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Neimenggu, Ningxia, Shaanxi, Shandong, Shanghai, Shanxi and Sichuan), GE, IR, JP (Hokkaido, Honshu, Kyushu and Shikoku), RU (Altai, Amur, Chechnya, Dagestan, Ingushetia, Khabarovsk, Kola Peninsula, Krasnodar, Kurily, Primorye, Sakhalin, Stavropol, Tomsk

and Tuva Regions), TR. Oriental: CN (Fujian, Guangdong, Guangxi, Guizhou, Hainan I., Hunan, Jiangxi, Yunnan, Zhejiang). UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Ivano-Frankivsk, Kharkiv, Kherson, Kirovograd, Kyiv, Lviv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae breed on dead insects, snails and vertebrates, including humans, rotten meat, garbage, bird and mammalian faeces (Artamonov, 1983; Jamagishi et al., 2003; Kano et al., 1967; Kirchberg, 1951; Okadome et al., 2002; Park, 1977; Rohdendorf, 1937; Verves & Khrokalo, 2006; Zakharova, 1961, 1965); known as parasitoids of succineid snails (Artamonov, 1983), predators of lepidopteran pupae *Dendrolimus pini* (Draber-Moňko, 1995), *D. spectabilis* (Kano & Kokubo, 1962), *Lymantria dispar* (Girfanova, 1958), *L. monachae* (Draber-Moňko, 1995), *Mamestra oleracea* (Povolný & Verves, 1990). Occasionally maggots colonize dead humans and have some importance as forensic indicators (Cherix et al., 2012; Guo et al., 2010b, 2011). This species reared in the laboratory on beef (Richet et al., 2011). Maggots produced facultative human aural (Chigusa et al., 1994; Hatsuchika et al., 1988, 2002; Yoneda & Iwami, 1981), cutaneous (James, 1947; Kano, 1962) and accidental intestinal (Ito & Koshimizu, 1955; Yoneda et al., 1998) myiasis. Hemisynanthropic species; adult flies are common in humid and mesophytic forest habitats, lowland marshes and human dwellings (Feng et al., 1990; Gunárová & Slamečková, 1967; Kano et al., 1967; Mitsui, 1996, 2002; Stackelberg, 1956). This species was found to be an indicator for urban habitats (Fremdt & Amendt, 2014). Flies were collected at altitudes up to 1000 m o. s. l. (Trofimov, 1969). Imago feed at dead mollusks and different vertebrates, sweat of man, mucous secrets from mouth and nose of hoof animals, aphid excreta (Artamonov, 1992, 1993; Povolný & Verves, 1990, 1997; Prado e Castro et al., 2010) and flowers of *Angelica silvestris*, *Pastinaca sativa*, *Thymus serpyllum* (Draber-Moňko, 1973), *Stapelia grandiflora* (Hori, 1967), *Solidago canadensis* (Verves, 2013).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, 19.08.1988, 1 ♂; (S. Zrazhevsky); Zarichchya I., 30.07.1968, 2 ♂ (O. Viktorov-Nabokov); Keleberda village, humid forest near pond, 20.05.2002, 1 ♂; Uman City: "Sofiivka" dendrological park, 11.06.2005, 1 ♂. Chernigiv Region: Borzna District: Makoshyno village, meadows, 20.08.2000, 2 ♂; Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 11.06.-24.08.2000, 23 ♂; Ichnya District: "Trostyanetz" Dendrological Park, meadows and forest at Lake coast, 6-7.08.1999, 7 ♂. Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, meadows along Samara River, 1.08.2000, 3 ♂; border of oak forest near lake, 2.08.2000, 1 ♂; humid meadow, at flowers of *Heracleum* sp., 5.08.2000, 2 ♂; feather grass steppe, 11.08.2000, 1 ♂ (Yu. Verves); bred from dead mice, no further data, 2 ♂, 1 ♀ (M. Shulman). Kyiv City: Desna District: "Druzhby Narodiv" Park, meadows nr Lake, 8.07.2005, 2 ♂; "Lisova" subway-station, 5 km E, mixed forest and bushes near Lake Lisove, 20.07.2004, 3 ♂; Dnipro District, Hydropark, bushes nr Berizka Lake, 16.06., 22.06. and 20.09.2010, 6 ♂; Rayduzny Massive, bushes on bank of Malynivka Lake, 23.06.2005, 1 ♂; Trukhaniv I., shores of Babyne Lake, 12.08.2007, 2 ♂; Holosiiv District, Baykove Cemetery, 13.07.-7.08.2003 and 16.08.2004, 7 ♂; "Didorovsky" pond, humid banks, 25.08.-4.09.1999, 11.07.-9.08.2002, 21.09.2003, 28.06.2004 and 12.09.2005, 26 ♂; Dyky island at Dnipro, sandy area, N 50°17'02", E 30°39'22" 2 ♂, 1 ♀; Holosiiv Park in memory Maxym Rylsky, 10.06.2009, 1 ♂; National Exhibition Centre, bushes, 27.08.1999 and 26.05.2002, 4 ♂; Pyrogiv village, field Museum, 24.08.1999, 1 ♂; "Sovky hole", humid meadow, 10.09.2000, 30-31.07., 29.08.2002, 27.06., 16.07.2003 & 3.05., 27.08.2004, 43 ♂; "Theophania" park, 19.06.2013 & 8.09.2014, 2 ♂ (Yu. Verves); Uralska street, 3-6.07.2009, 2 ♂ (A. Drozdovska); Vasylykivska street 33, yard, 7-27.07.2008, 27.05.2010, 31.05., 2.06. & 7.06.2010, 9 ♂; Vasylykivska street 98, yard, 15.05.-1.09.2002, 28 ♂; Williams street, dry meadows, 19.08.2002, 1 ♂; Pechersk District, Kyiv-Pechersk Lavra, bushes, 21.05.2009, 2 ♂; Obolon District, 2 km N of Moscow bridge, unnamed island on Dnipro, 27.06. & 29.08.2008, 2 ♂; Shevchenko square, humid meadow nr pond, 3-4.06.2000 and 15.07.2005, 8 ♂; unnamed island, N 50°30'25", E 30°31'16", 26.05., 16.06. & 22.09.2011, 5 ♂; Verbne Lake 31.08.2004, 1 ♂. Kyiv Region: Bila Tzerkva City, "Oleksandria" Dendrological Park, 3.05.2009, 1 ♂; Boryspil District, Rozhny village, bushes, 15-21.08.1999, 10 ♂; Brovary District, Zazymya village, meadows, 1.08.2001, 2 ♂; Obukhiv District: Ukrainka City, dry meadow and bushes, 14.09.2003, 1 ♂; Vyshgorod District: 20 km N of dam, left coast of Kyiv reservoir, sandy area and bushes, 5.8.2001, 2 ♂. Poltava Region: Pyryatyn District, Grabarivka village, meadows nr

Ruda River, 15.07.2009, 1 ♂; Lelyaky village, meadows at bank of Uday River, 16.08.2010, 1 ♂ (Yu. Verves). Sumy Region: Serednya Buda District, Desnyansko-Starogutsky National Nature Park, 8.07.2008, 1 ♂ (Yu. Protzenko); Romny City, banks of Romenka River, meadows and bushes, 21-27.08.2009, 10 ♂ (Yu. Verves); Vakolovshchyna village, humid meadow, 18-31.05.2006, 1 ♂ (O. Govorun). Zakarpattia Region: Mizhgirrya District, 2-4 km S of Kolochava village, along Tereblyya River, 500 m a. s. l., humid meadows, 12.08.1995, 1 ♂. Zakarpattia Region: Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140-150 m a. s. l., 16-23.08.2014, 4 ♂. Zaporizzhya Region: Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 1 ♂ (Yu. Verves).

78. *Parasarcophaga (s. str.) albiceps* (Meigen, 1826)

Distribution: Palaearctic: Europe: AL, AT, BA, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, ES, FI, FR (mainland); GR, HR, HU, IT (mainland and Sicily), LV, MD, MNE, NL, NO, PL, PT, RO, RS, RU (Bashkortostan, Ivanovo, Karelia, Kirov, Leningrad, Moscow, Vologda and Voronezh Regions), SE, SK, UA, UK; North Africa: DZ, EG; Asia: AM, AZ, CN (Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Neimenggu, Ningxia, Shaanxi, Shandong, Shanghai, Shanxi and Sichuan), EG (Sinai), GE, IL, JP (Hokkaido, Honshu, Kyushu and Shikoku), KP, KR, KZ, RU (Alania, Altai, Amur, Buryatia, Chechnya, Chita, Dagestan, Irkutsk, Karachay-Cherkessia, Kemerovo, Khabarovsk, Khakassia, Krasnodar, Krasnoyarsk, Kurily Is., Novosibirsk, Omsk, Sakhalin I., Tomsk, Tuva and Yakutia Regions), Tibet, TR. Afrotropical: KE. Oriental: BD, BT, CN (Fujian, Guangdong, Guangxi, Guizhou, Hainan I., Hunan, Jiangxi, Yunnan and Zhejiang); ID (Flores Is., Java, Kalimantan, Lombok, Sulawesi, Sumatra, Sumba and Timor), IN (Andaman Is., Andra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Dādra and Nagar Haveli, Daman and Diu, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Laccadive Is., Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Nicobar Is., Orissa, Pondicherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal), JP (Amami Is. and Ryukyu Is.), LK, MM, MY (Kuala Lumpur, Pahang, Penang, Perak, Sarawak, Selangor), PH (Balabac, Palawan and Tawi Tawi), PK (North-West Frontier and Punjab), SG, TH, TW, VN. Australasian/Oceanian: AU (Queensland), US (Hawaii: Hawaii, Kauai, Maui, Molokai, Oahu), ID (Irian Jaya, Maluku), PG (Bismarck Is., New Guinea), SB (Guadalcanal). UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Lviv, Mykolaiv, Odesa, Poltava, Sumy, Vinnytsia, Volyn, Zhytomyr, Zakarpattia, Zaporizzhya and Zhytomyr Regions.

Hemisinanthropic species (Stackelberg, 1956). Larvae breed from human and bovine faeces, dung, dead insects, snails, vertebrates, human corpses and decaying meat (Artamonov, 1983; Blackith & Blackith, 1988; Girfanova, 1962; Ishijima, 1967; Köhlhorn, 1986; Rohdendorf, 1959; Senior-White et al., 1940; Stackelberg, 1956; Shazia et al., 2006), garbage dumps (Aloke et al., 1989), facultative predators or parasitoids of lepidopteran pupae *Aporia crataegi* (Blunck & Wilbert, 1962; Fedotova, 1950; Vasilyev, 1902), *Dasychira albodentata* (Nakonechny et al., 1973), *Dendrolimus albolineatus* (Povolný & Verves, 1990), *D. pini*, *D. segregatus*, *D. sibiricus* (Baer, 1921; Kazanskij, 1927; Kolomyietz, 1952; Vasilyev, 1913), *Lymantria dispar* (Nakonechny, 1973a), *L. monacha* (Baer, 1921; Nakonechny, 1973b), *Nomagria* sp., *Orgyia antiqua*, *Selenephra lunigera* (Nakonechny, 1973a); larvae of tenthredinid *Acantholyda posticalis* (Lee, 1963) and cerambycid beetle *Saperda populnea* (Kleine, 1910); adult scarabaeid beetles *Melolontha* sp., *Oryctes nasicornis*, *Polyphylla fullo* (Baer, 1921); reared in the laboratory on beef (Richet et al., 2011). This species is used as forensic indicator (Guo et al., 2010a, b, 2011; Mohamed Aly & Wen, 2013; Mohamed Aly et al., 2013a, b; Tan et al., 2010). The maggots are involved in cases of cutaneous myiasis of buffalo, cows and humans (Castro et al., 2010; James, 1947; Sucharit et al., 1976). Adults are common in flood markets (Aloke et al., 1989; Aradi & Mihályi, 1971) and other settlemental habitats, in forest coenoses, the most frequently in forest-steppes and oak forests (Artamonov, 1985), in limestone gorges, coastal dunes, floodplains, meadows and wooded areas (Richet et al., 2011); collected at altitudes up to 1500-2000 m o. s. l. (Feng, 2006; Kano et al., 1999; Rohdendorf, 1966). This species was found to be an indicator for rural habitats (Fremdt & Amendt, 2014). Flies has been observed to larviposit on mutton (Singh & Bharti, 2008) and are frequent visitors of faeces, decaying meat, human sweat (Artamonov, 1988; Povolný & Verves, 1997; Stackelberg, 1956), flowers of *Anethum graveolens*, *Solidago canadensis* (Verves, 2003), *Angelica*

sp., *Pastinaca* sp. (Séguy, 1941), *Cirsium arvense*, *Peucedanum oreoselinum*, *Prunus spinosa* (Draber-Moňko, 1973), *Bulbophyllum putidum*, *Sapria pan* and fallen fruits of *Dimocarpus longan*; females larviposit exclusively on faeces, not on carrion (Bänziger & Pape, 2004).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 3. & 7.06.2003, 2 ♂; 10.06.2006, 1 ♂; Krugly I., 16.08.1986, 2 ♂; Zmiyini Is., coast of Kaniv lake, 23.05.2003, 1 ♂ (A. Drozdovska, Yu. Verves, S. Zrazhewsky); Uman City: "Sofiivka" dendrological park 11.06.2005 & 13-14.06.2006, 3 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 8-12.07.2000, 10 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 5-8.08.1999, 2 ♂ (Yu. Verves). Kirovograd Region: Znamenska City: forest road, on faeces, 19.07.1962, 2 ♂ (O. Viktorov-Nabokov). Kyiv City: Desna District, "Druzhby Narodiv" park, meadows nr Lake, 8.07.2005, 1 ♂; "Lisova" subway-station, 5 km E, mixed forest and bushes near Lake Lisove, 20.07.2004, 7 ♂; Dnipro District: Hydropark, banks of Berizka Lake, bushes, 22.06.2006 & 16.06.2010, 6 ♂; Rayduzny Massive, bushes on bank of Malynivka Lake, 23.06.2005, 2 ♂; Holosiiv District: Baykove Cemetery, 16.08.2004, 1 ♂ (Yu. Verves); "Didorovsky" pond, humid banks, 11.07-9.08.2002, 21.09.2003 & 28.06.2004, 12 ♂ (A. Drozdovska, Yu. Verves); Dyky I. at Dnipro, sandy area, N 50°17'02", E 30°39'22", 30.06.2011, 2 ♂; Holosiiv Park in memory Maxym Rylsky, 10.06.2009, 1 ♂; Kozacha street, on leaves and walls of buildings, 7.07.2005, 9 ♂; National Exhibition Centre, bushes, 27.08.1999, 3 ♂; Olzhyn I. at Dnipro, 10 km S of Kharkiv Bridge, 8.07. and 16.09.2009, 9 ♂; "Sovky hole", meadows nr ponds, 3-4.06.2000, 30.07.- 29.08.2002, 27.06.- 16.07.2003, 15.07.2005.06.2011, 41 ♂ (Yu. Verves); Uralska street, yard, 3-6.07.2009, 3 ♂ (A. Drozdovska); "Theophania" park, 19.06.2013, 2 ♂; Vasylkivska street 33, yard, 25.06.2008, 28.05.- 26. 06.2009, 27.05., 7.06., 7.07. & 28.07.2010, 13 ♂; Vasylkivska street 98, yard, 9.05.- 17.08.2002, 34 ♂; Williams street, dry meadows, 19.08.2002, 2 ♂; Obolon District: Shevchenko square, humid meadow nr pond, 3-4.06.2000, 15.07.2005 and 27.09.2006, 7 ♂; unnamed island on Dnipro, N 50°30'25", E 30°31'16", 30.05.2008, 26.05., 16.06. & 22.09.2011, 9 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 2 ♂; Kyiv Region: Boryspil District, Rozhny village, bushes, 15-18.08.1999, 2 ♂; Kyiv-Svyatoshyn District: Irpin City, 2-4 km E, forest nr bog, 26.04.2003, 1 ♂. Poltava Region: Pyryatyn District: Grabarivka village, meadows nr Ruda River, 15.07.2009, 1 ♂; Lelyaky village, meadows at bank of Uday River, 16.08.2010, 1 ♂. Sumy Region: Trostyanetz City, meadows, 3.08.1999, 1 ♂. Zakarpattia Region: Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 160 m a. s. l., 18.08.2014, 1 ♂. Zaporizhzhya Region: Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 3 ♂ (Yu. Verves).

79. *Robineauella (Digitiventra) pseudoscoparia* (Kramer, 1911)

Distribution: Holarctic: Europe: AT, CH, CZ (Moravia), DE, HU, IT (mainland), NL, PL, RO, RU (Bashkortostan, Leningrad, Moscow, Nizhny Novgorod, Orenburg, Perm and Voronezh Regions), SK, UA; Asia: CN (Hebei, Heilongjiang, Jilin, Liaoning, Shaanxi), JP (Hokkaido), KR, MN, RU (Altai, Amur, Chita, Khabarovsk, Magadan, Primorye, Sakhalin and Tuva Regions); North America: US (no more detailed data; probably introduced). Oriental: TH. UA: Kyiv Region¹⁵.

Larvae are bred from dead insects and vertebrates (Artamonov, 1983, 1988); known as facultative predators of lepidopteran pupae of *Aporia crataegi* (Kolomyietz, 1958), *Cosmotriche potatoria* (Artamonov, 1985; Zinovyev, 1962), *Dasychira albodentata* (Ivliev & Sinchylina, 1962; Nakonechny, 1973a; Zinovyev, 1962), *Dendrolimus pini* (Verves & Khrokalo, 2006), *D. sibiricus* (Boldaruev, 1952; Kolomyietz, 1952, 1958; Orlov & Yurchenko, 1978; Zinovyev, 1962), *Lymantria dispar* (Artamonov, 1985, 1988; Coulson et al., 1986; Girfanova, 1957, 1962; Khanislamov et al., 1958; Kolomyietz, 1958, 1966; Nakonechny, 1973a; Skufyin & Khitzova, 1967), *L. monacha* (Kolomyietz, 1958; Kramer, 1911, 1917; Nakonechny, 1973b), *Malacosoma neustria* (Verves & Khrokalo, 2006), *Orgyia antiqua*, *Selenephra lunigera* (Nakonechny, 1973a). Flies at forest borders, in bushes, parks and gardens (Artamonov, 1988; Povolný & Verves, 1997; Verves & Khrokalo, 2006); in mountains at altitudes up to 1600 m a. s. l. (Kurahashi & Chaiwong, 2013). Imagoes feed at cadavers, faeces, flowering plants, aphid excreta (Artamonov, 1988; Verves & Khrokalo, 2006).

¹⁵ based on a single data (Bilanovsky, 1931).

80. *Robineauella (s. str.) caerulescens* (Zetterstedt, 1838)

Distribution: Holarctic: Europe: AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland), HR, HU, IT (mainland and Sicily), LT, LV, NO, PL, RO, RS, RU (Bashkortostan, Ivanovo, Kaliningrad, Karelia, Kirov, Kursk, Leningrad, Moscow, Murmansk, Orenburg, Perm and Voronezh Regions), SE, SI, SK, UA, UK; Asia: AM, AZ, CN (Jilin, Sichuan, Xinjiang), GE, JP (Honshu), KG, Korean Peninsula, KZ, MN, RU (Altai, Amur, Buryatia, Chita, Chukotka, Irkutsk, Jewish Authority, Kamchatka, Karachay-Cherkessia, Kemerovo, Khabarovsk, Koryak Authority, Krasnodar, Krasnoyarsk, Kuril Is., Magadan, Primorye, Sakhalin, Stavropol, Tomsk, Tuva and Yakutia Regions), Tibet, TJ. North America: CA (Yukon Territory), US (Alaska). Oriental: CN (Yunnan). UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk*, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Lviv, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae develop in dead or dying snails, insects and in carcasses of small mammals, birds, amphibian and fish (Artamonov, 1988; Groth & Reissmueller, 1973; Kolomyietz, 1966; Kühlhorn, 1986; Povolný & Verves, 1990; Rohdendorf & Grunin, 1938; Verves & Khrokalo, 2006) and facultative predators on lepidopteran pupae of *Lymantria dispar* (Girfanova, 1958), *L. monacha* (Čepelák, 1956; Girfanova, 1962; Ségué, 1941). Occasionally maggots colonize dead humans and have some importance as forensic indicators (Cherix et al., 2012). Their laboratory rearing is easy on meat (especially on liver), because young maggots kill other competing larvae on most substrates exposed to oviposition in nature (Hanski, 1987; Richet et al., 2011). Adult flies prefer semi-shaded forested or bushy formations in lowland and montane elevations up to the timberline (2100-2500 m a. s. l.) (Povolný & Verves, 1997; Richet et al., 2011; Sychevskaya & Vtorov, 1970; Ziegler & Lange, 2001). This species was found to be an indicator for rural habitats (Fremdt & Amendt, 2014). Flies feed at flowers and visit decaying organic substrates: corpses, faeces, rotten fruits, aphid excreta (Povolný & Verves, 1990, 1997; Sychevskaya, 1966).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 10.06.2006, 1 ♂ (A. Drozdovska); Uman City, "Sofiivka" Dendrological Park, 11.06.2005, 1 ♀. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 24.08.2000, 1 ♂; Ichnya District: "Trostyanetz" Dendrological Park, meadows and forest at Lake coast, 5-12.08.1999, 5 ♂. Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, bred from dead mice, no further data, 2 ♂, 1 ♀ (M. Shulman); Kyiv City: Dnipro District: Hydropark, sandy bank of Berizka Lake, 20.09.2006, 1 ♀ (Yu. Verves). Holosiiv District: "Didorovsky" pond, humid meadow, 21.09.2003, 1 ♀ (A. Drozdovska); "Theophania" park, 19.06.2013 & 8.09.2014, 1 ♂, 1 ♀; Vasylkivska street 98, yard, 26.05.2002, 1 ♂; Williams street, dry meadows, 28.07.2001, 1 ♂ (Yu. Verves). Kyiv Region: Vysjgorod District: Lyutizh village, 25.02.2012, 1 ♀ (L. Frantzevich). Poltava Region: Grebinky District: Marynivka village, 9.07.08, 1 ♀ (A. Drozdovska); Pyryatyn District: Keybalivka village, meadows at bank of Uday river, 11.07.2009, 1 ♀ (V. Gorobchyshyn). Sumy Region: Romny City, banks of Romenka River, meadows and bushes, 27.08.2009, 1 ♂. Vinnytsia Region: Chechelnyk District: Chechelnyk City, 4.5 km S, "Karmelyuk's Podillya" National Nature Park, "Vyschenke" locality, 26-27.05.2014, 2 ♂, 1 ♀ (V. Gorobchyshyn). Zakarpattia Region: Mizhgyrria District: Kolochava village, along Kvasonetz stream, 600 m a. s. l., stones, 12.08.1995, 1 ♂; along Tereblyia River, 500 m a. s. l., humid meadows, 12.08.1995, 1 ♂; Uzhgorod District: Nyzhne Solotvyno village, tip of hill, beech forest, 98°33'N, 22°26'E, 200 m a. s. l., 22.08.2014, 1 ♂ (Yu. Verves).

Subtribe Sarcophagina**81. *Sarcophaga bachmayeri* Lehrer, 1978**

Distribution: Palaearctic: Europe: AT, HU, SK, UA: Zakarpattia Region.

This species accompanies borders of mountain forests preferring elevations 800-1200 m a. s. l. (Povolný, 1997, 2000; Povolný & Verves, 1997). Flying period from end of April to end of September (original data).

Material examined: Zakarpattia Region: Perechyn District: Turyi Remety village, 15.05.1965, 3 ♂; Rakhiv City, 27.05.1965, 2 ♂ (O. Viktorov-Nabokov); Velyko-Berezhny City, 22.07.1964, 1 ♂ (L. Zimina).

Slovakia: Bojnice, nr bog, 15. & 19.08.1957, 5.08.1961, 3 ♂; Homôlka, 14.07.1967, 1 ♂; Jankov víšok, 30.04.1957, 6 ♂; Šútovce, 27.09.1957, 2 ♂ (J. Čepelák, V. Gunárová, M. Slamečková).

82. *Sarcophaga baraschi* Lehrer, 1977*

Distribution: Europe: HU, RO, SK, UA: Dnipropetrovsk Region. This species firstly recorded for Ukraine¹⁶.

Common at dry meadows and in feather-grass steppe at the bottom and slopes of ravine (Verves, 2000).

Material examined: Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, bottom of steppe ravine, 4-15.06.2008, 12 ♂ (Yu. Verves).

83. *Sarcophaga bergi* Rohdendorf, 1937

Distribution: Palaearctic: Europe: BG, RS, UA; Asia: GE, IL, JO, SY, TR. UA: Crimea.

Stenoecious and thermophile form (Povolný & Verves, 1990).

Material examined: Crimea: Alushta City: bank of sea, stones, 20.08.1976, 3 ♂ (Yu. Verves).

84. *Sarcophaga carnaria* (Linnaeus, 1758)

Distribution: Palaearctic: Europe: AT, BG, BE, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, FI, FR (mainland), HR, HU, IE, IT (mainland, Sardinia and Sicily), LT, LU, LV, MD, MT, NO, PL, RO, RU (Bashkortostan, Ivanovo, Karelia, Kursk, Leningrad, Lipetzk, Moscow, Voronezh and Yaroslavl Regions), SE, SK, UA, UK (England); Asia: AM, AZ, EG (Sinai), GE, IL, KZ, RU (Altai, Chechnya, Igushetia, Irkutsk, Kabardi-Balkaria, Karachay-Cherkessia, Krasnodar, North Osetia, Novosibirsk, Stavropol and Tomsk Regions), SY, TR. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Vinnytsia*, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are essentially parasitoids of earthworms (Eberhard, 1955; Grunin, 1964; Kirchberg, 1954, 1961; Viktorov-Nabokov & Verves, 1975); females larviposited on freshworm casts; this species is not developed in invertebrate and vertebrate corpses (Blackith et al., 1994). Flies feed at corpses, faeces, aphid excreta, rotten fruits (Sevgili et al., 2004b; Verves & Khrokalo, 2006), flowers of *Anethum graveolens*, *Heracleum sibiricum*, *Solidago canadensis* (Verves, 2003). This species prefers the vicinity of humid forests or sometimes the forest interior, meadows, borders of roads, parks and gardens (Povolný & Verves, 1997; Verves & Khrokalo, 2006) up to 2500 m a. s. l. (Ziegler & Lange, 2001).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, at vegetation, 20.05. and 3.06.2003, 3 ♂; Uman District: "Sofiivka" Dendrological Park, 11.06.2005 & 13-14.06.2006, 13 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 11.07. & 24.08.2000, 2 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 4-13.08.1999, 19 ♂. Crimea: Bakhchysaray District: Berego village, sandy area, 1.08.2004 (Yu. Verves), 1 ♂; Theodosia Municipal Government: Karadagh Natural State Reserve, 3.07.2006, 1 ♂ (A. Drozdovska). Kyiv City: Dnipro District: Hydropark, bushes nr Berizka Lake, 22.06.2006 & 16.06.2010, 7 ♂; Rayduzhny Massive, bushes on bank of Malynivka Lake, 23.06.2005, 1 ♂; Holosiiv District: Baykove Cemetery, 13.07., 24.09.2003 & 16.08.2004, 17 ♂; Chervonozyryany avenue 126, wall of building, 15.07.2011, 1 ♂; "Didorovsky" pond, humid banks, 25.08-5.09.1999, 11.07-9.08.2002, 21.09.2003 & 28.06.2004, 30 ♂; Dyky I. at Dnipro, N 50°17'02", E 30°39'22", sandy area, 6.10.2011, 1 ♀; "Holosiiv" Park in memory M. Rylsky, 10.06.2009, 4 ♂; Kozacha street, on leaves and walls of buildings, 7.07.2005, 5 ♂; National Exhibition Centre, bushes, 27.08.1999 and 26.05.2002, 7 ♂; Olzhyn I. at Dnipro, 10 km S of Kharkiv Bridge, 16.09.2009, 1 ♂ (Yu. Verves); "Prospekt Nauki"

¹⁶ Verves (1998) mixed this species with "*Sarcophaga ukrainica* Rohd."

avenue, hills "Lysa Gora", bushes, 8.05.2003 & 19.08.2004, 18 ♂ (A. Drozdovska, Yu. Verves); "Sovky hole", coast of pond, humid meadows, 10.09.2000, 30-31.07. & 29.08.2002, 27.06., 16.07. and 1.08.2003, 3.05. & 27.08.2004, 9.06.2011, 35 ♂; "Theophania" Park, 11.06.-29.07.2013 & 8.09.2014, 10 ♂ (Yu. Verves); Uralska street, yard, 3-6.07.2009, 2 ♂ (A. Drozdovska); Vasytkivska street 33, yard, 25.06.-8.08.2008, 28.05.-2.09.2009, 27.05.2010, 31.05.- 29.06.2010, 58 ♂; Vasytkivska street 98, yard, 29.04.-6.09.2002, 163 ♂; indoor of laboratory building, on windows, 28.10.2002, 3 ♂; Williams street, dry meadows, 10-28.07.2001 and 25.04.-19.08.2002, 32 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes, 21.05.2009, 3 ♂; Obolon District: Moscow Bridge, 2 km N, unnamed island on Dnipro, 30.05.2008, 2 ♂; Shevchenko square, 5 ♂; Podil District: Shevchenko square, humid meadow nr pond, 15.07.2005 & 27.09.2006, 24 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-28.8.2003, 38 ♂. Kyiv Region: Bila Tzerkva City: "Oleksandria" Dendrological Park, 3.05.2009, 3 ♂; Boryspil District: Rozhny village, bushes, 16.08.1999, 1 ♂; Brovary District: Zazymya village, meadows, 1.08.2001, 1 ♂. Kyiv-Sviatoshyn District: Hostomel village, 4 km N, meadows at right bank of Irpin River, 8.07.2001, 1 ♂; Irpin City, forest nr bog, 26.04.2003, 2 ♂; Obukhiv District: Velyki Dmytrovychi village, grass coast of stream, 2.05.1999, 1 ♂; Tatzenky village, 14.09.2003, at ground at border of pine forest, 2 ♂; Ukrainka City: at ground at border of pine forest, 21.08.2004, 1 ♂. Poltava Region: Pyryatyn District: Davydivka village, meadows, 15.07.2009, 4 ♂ (Yu. Verves); Gurbyntzi village, on flowering *Apiaceae*, 18-23.07.2005, 6 ♂ (A. Drozdovska); Keybalivka village, meadows near Uday River, 11-18.07.2009, 4 ♂. Sumy Region: Romny City: banks of Romenka River, meadows and bushes, 21-27.08.2009, 11 ♂ (Yu. Verves); Sumy District: Vakolovshchyna village, humid meadow, 18-31.05.2006 and 5-14.06.2007, 4 ♂ (O. Govorun). Ternopil Region: Zaleschyky City: coast of Dnister, 20-21.05.1986, 1 ♂ (S. Zhrazhevsky). Vinnytsia Region: Chechelnyk District: Chechelnyk City, 4,5 km S, "Karmelyuk's Podillya" National Nature Park, "Vyshenke" locality, 26-27.05.2014, 1 ♂ (V. Gorobchyshyn). Zakarpattia Region: Mizhgyrria District: Kolochava village, 500 m a. s. l., Biological station of Uzhgorod University, 15.08.1995, 2 ♂; 2-4 km S, along Kvasonetz stream, 600-1000 m a. s. l., 12-17.08.1995, 30 ♂; along Tereblya River, 500 m a. s. l., humid meadows, 12.08.1995, 11 ♂; 5 km W, 1000-1400 m a. s. l., alp steppe, 14-15.08.1995, 13 ♂; 7 km SE, 1200 m a. s. l., "Krasna" alp steppe, 16.08.1995, 22 ♂; Uzhgorod District: Nyzhne Solotvyno village, meadows and beech forest, 98°33'N, 22°26'E, 140-200 m a. s. l., 16-23.08.2014, 25 ♂. Zaporizhzhya Region: Melitopol City: "Kamyany Mogyly" State Reserve, at stones, 28.08.1997, 16 ♂; Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, estuary of Samara River, meadows, 23. & 28.08.1997 and 4-15.06.2008, 12 ♂ (Yu. Verves). Zhytomyr Region: Zhytomyr City: coast of Teteriv, 17.05.1988, 1 ♂ (S. Zhrazhevsky).

85. *Sarcophaga jupalnica* Lehrer, 1967*

Distribution: Europe: RO, UA: Ivano-Frankivsk and Vinnytsia Regions. This species firstly recorded for Ukraine.

Material examined: Ivano-Frankivsk Region: Kosiv District: Rozhniv village, bushes, 23.05. & 20.08.1975, 2 ♂ (Yu. Verves). Vinnytsia Region: Chechelnyk District: "Karmelyuk's Podillya" National Nature Park, Lyubashivka village, 5.07.2013, 1 ♂ (V. Gorobchyshyn).

86. *Sarcophaga hennigi* Lehrer, 1978

Distribution: Europe: AT, CH, HR, RS, SI, UA: Zakarpattia Region.

Material examined: Zakarpattia Region: Uzhgorod District, Nyzhne Solotvyno village, 98°33'N, 22°26'E, 140 m a. s. l., hornbeam forest border, on leaves, 16. & 20.08.2014, 3 males (Yu. Verves).

Austria: without day date: Umg. Admont, Styr., 5 ♂; Umg. Bad Aussee, 1 ♂; Göller Subalp, A. l., 1 ♂; Umg. Gosau, A. s., 2 ♂; Klachau-Tauplitz, Styr. b., 1 ♂; Gr. Löckenmoos b. Gosau, 1 ♂; Oberlaussa, A. s., 3 ♂; Pfaffenkogel bei Stübing, 1 ♂; Prebersee, 1 ♂; Ramsau bei Schladming, Styr., 1 ♂; Sengsengebirge, A. s., 1 ♂ (H. Franz).

87. *Sarcophaga lehmanni* Müller, 1922

Distribution: Palaearctic: Europe: AD, AL, AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES (mainland and Balearic Is.), FR (mainland), GR, HR, HU, IT (mainland and Sicily), LT, LV, MD, MT, NL, PT, RO, RS, RU (Bashkortostan, Ivanovo, Moscow, Karelia, Kirov, Kursk, Nizhny Novgorod, Leningrad, Lipetzk, Voronezh and Yaroslavl Regions), SE, SK, TR, UA; North Africa: DZ, MA; Asia: AF, AM, AZ, EG (Sinai), GE, IL, IR, IQ, KZ, RU (Chechnya, Dagestan, Ingushetia, Kemerovo, Krasnodar, Novosibirsk, Tyumen and Sverdlovsk Regions), SA, SY, TM, TR, UZ. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae bred on rotten fish and mammals (Khitzova, 1967), living earthworms (Eberhardt, 1955; Viktorov-Nabokov & Verves, 1975), especially *Allolobophora* spp. (Kirchberg, 1961) and on larvae of lepidopteran hosts *Erannis defoliaria* (Geometridae) and *Lymantria dispar* (Lymantriidae) (original data). Imagoes distributed in mesophytic forests, borders of ponds and streames, near buildings, at roads, ground, leaves, on walls of buildings (Verves, 2013). Flies attracted to cattle dung, faeces (Martínez-Sánchez et al., 2000b; Trofimov, 1969), piglet carcasses (Prado e Castro et al., 2010), flowers of *Anethum graveolens* and *Solidago canadensis* (Verves, 2003).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, yard, 3-8.06.2003 & 10.06.2006, 4 ♂; coast of Dnipro, 16-19.08.1988, 5 ♂; Krugly I., 6. & 30.07.1986, 2 ♂; (A. Drozdovska, Yu. Verves, S. Zrazhewsky); Khreshchatyk village, 29.08.2003, 1 ♂ (A. Drozdovska); Keleberda village, sandy dunes, 12.05.2004, 1 ♂ (Yu. Verves); Trakhtemyriv village, 30 km N of Kaniv, 30.06.1988, 2 ♂ (S. Zrazhewsky). Chernigiv Region: Borzna District: Makoshyno village, meadows, 20.08.2000, 25 ♂; Yaduty village, Biological Station of Nizhyn University, pine forest, 11.06.-25.08.2000, 278 ♂; Ichnya District: "Trostyanetz" Dendrological Park, meadows and forest at Lake coast, at ground and leaves, 5-13.08.1999, 196 ♂ (Yu. Verves); Sosnytsya District: Khlopyanyky village, forest border, 7-22.07.2003, 7 ♂ (A. Drozdovska, L. Khrokalo). Crimea: Bakhchisaray District: Beregove village, sandy area, 11-23.08.1996, 4 ♂ (Yu. Verves); Simferopol City: Gagarin Park, banks of Salgir river, meadows, 9.05.2005, 1 ♂ (L. Khrokalo). Dnipropetrovsk Region: Novomoskovsk District: Andriivka village, border of oak forest near lake, meadows, feather grass steppe, 2.-11.08.2000, 36 ♂; Fedorivka village, meadows along Samara River, 1.08.2000, 11 ♂. Kherson Region: Genichesk District: Chernigivka village, coast of Sivash lagoon, steppe ground road, old mulberry plantation, on drop, forest shelter belt, 11-24.07.1998, 73 ♂. Kyiv City: Desna District: "Druzhby Narodiv" park, sandy coast of Dnipro and dry meadows, 1.07.2001 & 8.07.2005, 21 ♂; "Lisova" subway-station, 5 km E, mixed forest and bushes on bank of Lisove lake, 20.07.2004, 2 ♂; Dnipro District: Hydropark, bushes nr Berizka lake, 22.06. & 20.09.2006, 12.06.2007 & 16.06.2010, 49 ♂, 1 ♀; Moscow bridge, 2 km N, unnamed island on Dnipro, 16.-30.05. and 28.08.2008, 4 ♂; Rayduzhny Massive, bushes on bank of Malynivka lake, 23.06.2005, 7 ♂; Trukhaniv Is., bank of Babyne lake, 12.08.2007, 1 ♂; Holiiv District: Baykove Cemetery, 13.07.-30.09.2003 & 16.08.2004, 48 ♂; "Didorovsky" pond, humid banks, 25.08-4.09.1999, 11.07-9.08.2002, 21.09.2003, 28.06.2004 & 12.09.2005, 39 ♂; Dyky island at Dnipro, sandy area, N 50°17'02", E 30°39'22" 8.09.2011, 1 ♂; Holiiv Park in memory Maxym Rylsky, 10.06.2009, 15 ♂; Holiivska street 12, wall of building, 50°24'25"N, 30°30'22"E, 16.09.2011, 1 ♂; Kozacha street, on leaves and walls, 7.07.2005, 19 ♂; Kozachy I. at Dnipro, 12 km S of Kyiv City, 9.09.2009, 2 ♂; National Exhibition Centre, bushes, 27.08.1999 & 26.05.2002, 8 ♂; "Prospect Nauki" avenue, hills "Lysa Gora", bushes, 8.05.2003, 17-19.08.2004 & 14.05.2005, 51 ♂; Pyrogiv field Museum, 24.08.1999 & 28.05.2000, 50 ♂; "Sovky hole" ponds, humid meadow, 10.09.2000, 31.07.2002, 16.07. & 1.08.2003, 3.05. & 27.08.2004 & 11.07.2005, 18 ♂; "Theophania" park, 11.06.-29.07.2013 & 8.09.2014, 50 ♂, 1 ♀; Uralska street, 3-6.07.2009, 4 ♂; Vasylykivska street 33, yard, 23.06.-8.08.2008, 18.05.-1.10.2009, 5.05. - 28.07.2010 & 9.06.2011, 144 ♂; Vasylykivska street 98, yard, 20.04.-3.10.2002, 327 ♂; indoor of laboratory building, on windows, 5.09.2002, 1 ♂; Williams street, dry meadows, 10-28.07.2001 & 25.04.-19.08.2002, 36 ♂; Obolon District: Redkino Lake, sandy shores 4.07.2004, 2 ♂; Verbne Lake, 21.04. & 31.08.2004, 4 ♂, 3 ♀; unnamed island on Dnipro, N 50°30'25", E 30°31'16", 28.04. -22.09.2011, 46 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 33 ♂; Podil District: Shevchenko square, humid meadow nr

pond, 3-4.06.2000, 15.07.2005 & 27.09.2006, 66 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 35 ♂ (A. Drozdovska, L. Khrokalo, Yu. Verves); Kyiv Region: Bila Tzerkva City: "Oleksandriya" park, 3.05.2009, 12 ♂; Boryspil District: Rozhny village, bushes at coast of Dnipro, 15-22.08.1999, 54 ♂; Brovary District: Zazymya village, 5 km N, meadows near Desna, 1.08.2001, 3 ♂; Kyiv-Svyatoshyn District: Gostomel village, 4 km N, meadows at right bank of Irpin river, 8.07.2001, 9 ♂; Irpin City, 2-4 km E, forest nr bog, 26.04.2003, 17 ♂; Kruglyk village 10 km S of Kyiv, meadow nr pond, 30.04.2000, 7 ♂; Moshchun village, humid meadows near forest stream, 8.09.2003, 4 ♂ (Yu. Verves); Novosilky village, maple forest, host (*Erannis defoliaria*) collected in April 1987, 1 ♂ bred 28-29.05.1987 (V. Rafalsky); Zhukiv I., 20 km S of Kyiv, 9.09.2002, 1 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 29.05., 4.06.2003 & 12.05., 15.06.2004, 26 ♂; Obukhiv District: Stugna river nr Kyiv-Obukhiv road, sandy coast 27.5.2001, 9 ♂; Tatzenky village, 3 km S, at leaves and ground at border of pine forest nr lake, 14.09.2003, 8 ♂; Ukrainka City, 4 km W, at leaves and ground at border of pine forest nr lake, 21.08.2004, 3 ♂; Velyki Dmytrovychi village, grass coast of stream & asp forest nr bog, 27.06.1997, 2.05., 4.07.1999 & 29.06.2001, 33 ♂; Vyshgorod District: Osishchyna village, coast of lake, meadows, 3.06.2007, 1 ♂ (Yu. Verves). Mykolaiv Region: Berezanka District: Tiligul lyman, coast, 21.05.1988, 1 ♂ (S. Zrazhewsky). Ochakiv District: Kinburn sandy area, 10.05.2004, 2 ♂. Odesa Region: Ismail District: Ismail City, 4-8.08.2009, 1 ♂; Kyslytzya village, 5 km SE, 7. and 9.08.2009, 2 ♂; Maly Taman I., 15.07.2003, 1 ♂; Suvorove village, 20-23.08.2009, 1 ♂ (V. Corobchysyn, Yu. Protzenko). Poltava Region: Grebinky District: Kulazhyntzy village, meadows, 13 and 15.08.2010, 5 ♂; Marynivka village, 9.07.08, 1 ♂; Oleksandrivka village, kurgan "Gostra Mogyla", 14.07.2009, 1 ♂; Shkuraty village, locality "Ostriv, sandy road, 15.08.2010, 3 ♂; Ulyanivka village, meadows, 13.07.2009, 1 ♂; Pyryatyn District: Bilotzerkivtzi village, locality Murentzeve, 15.08.2010, 3 ♂; Davydivka village, meadows, 15.07.2009, 1 ♂; Deymanivka village, locality "Kuty", meadows, 8.07.2009, 1 ♂; Grabarivka village, meadows nr Ruda river, 15.07.2009, 22 ♂; Gurbyntzi village, on flowering *Apiaceae*, 18-22.07.2005, 11 ♂; Kaplyntzi village, meadows, 13.07.2009, 1 ♂; Keybalivka village, meadows near Uday river, 11-18.07.2009 & 15.08.2010, 10 ♂; Kharkivtzy village, 2 km S, locality "Velyki Solontzi", 13-14.07.09, 1 ♂; Kroty village, 8.07.08, 2 ♂; Lelyaky village, 17-21.7.2005, 11.07.2009, 12. & 16.08.2010, 25 ♂; Masalske village, meadows at bank of Uday river, 14.08.2010, 3 ♂; Povstyn village, locality "Burty", meadows, 12.07.2009, 1 ♂; Shkuraty village, meadows, 17.07.2009, 2 ♂ (A. Drozdovska, Yu. Protzenko, O. Tkachenko, Yu. Verves). Sumy Region: Serednya Buda District: Desnyansko-Starogutsky National Nature Park, 8.07.2008, 1 ♂ (Yu. Protzenko); Romny City: banks of Romenka river, meadows and bushes & at flowers of *Taraxacum officinale*, 21-30.08.2009 & 5.05.2013, 114 ♂ (Yu. Verves); Sumy District: Vakolovshchyna village, humid meadow, 18.05.2006, 2 ♂ (O. Govorun); Trostyanetz City: meadows and forest at lake coast, 3.08.1999, 12 ♂ (Yu. Verves). Zakarpattia Region: Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140-160 m a. s. l., 16-23.08.2014, 26 ♂; Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140 m a. s. l., 16-23.08.2014, 1 ♂. Zaporizhzhya Region: Melitopol City: "Kamyany Mogyly" Reserve, at stones, 28.08.1997, 13 ♂; Yakymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, estuary of Altagir river, meadows and bushes, 23-28.08.1997 & 4-15.06.2008, 13 ♂; (Yu. Verves).

88. *Sarcophaga moldavica* Rohdendorf, 1937

Distribution: Palaearctic: Europe: CZ (Moravia), HR, HU, MD, PL, RO, SK, UA: Chernivtsi, Odesa and Zakarpattia Regions.

This species is accompanying the natural dry forest stands at lower elevations (Povolný & Verves, 1997).

Material examined: Zakarpattia Region: Mizhgirrya District: Kolochava village, 5 km W, 1000-1400 m a. s. l., alp steppe, 14-14.08.1995, 2 ♂.

89. *Sarophaga mouchajosefi* Lehrer, 1978*

Distribution: Palaearctic: Europe: CZ (Moravia), SK*, UK*

Material examined: Zakarpattya Region: Rakhiv Disdtrict: bank of Apshynetz Lake, humid meadow, 1500 m a. s. l., 5.08.1964, 1 ♂ (L. Zimina). Slovakia: Skýcov, 22.05.1958, 1 ♂ (J. Čepelák); 12.09.1958, 1 ♂ (Pláček).

90. *Sarcophaga schusteri* Lehrer, 1959

Distribution: Palaearctic: Europe: AT, BG, CZ (Moravia), FR, HU, IT (Sicily), RO, SK, UA: Cherkasy*, Chernigiv*, Chernivtsi* and Zakarpattya Regions.

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, hill “Maryina Gora”, 220 m a. s. l., 26.06.2010, 1 ♂ (Yu. Protzenko); Chernigiv Region: Ichnya District: “Trostyanetz” dendrological park, meadows and forest at coast of lake, 5.08.1999, 1 ♂; Chernivtsi Region: 25 km SW Dolyshtnyy Shepit village, 1300 m o. s. l., tip of Magura Mt., 12.07.2000, 6 ♂; Zakarpattya Region: Mizhgirrya District: Kolochava village, 5 km W, 1000-1400 m a. s. l., alp steppe, 14-14.08.1995, 13 ♂; 7 km SE, 1200 m a. s. l., alp steppe “Krasna”, 16.08.1995, 17 ♂, 1 ♀ (one pair was collected *in copula*); Uzhgorod District: Nyzhne Solotvyno village, tip of hill, beech forest, 98°33'N, 22°26'E, 200 m a. s. l., 16-23.08.2014, 1 ♂ (Yu. Verves).

91. *Sarcophaga serbica* Baranov, 1930

Distribution: Palaearctic: Europe: BG, IT (mainland), RO, RS, RU (Moscow); SK, UA: Kharkiv Region and Kyiv City.

Flies prefer warm, moderately humid forests (Povolný & Verves, 1997).

Material examined: Kyiv City: Vasylykivska street 98, yard, 5.05.2002, 1 ♂ (Yu. Verves).

92. *Sarcophaga subvicina* Rohdendorf, 1937

Distribution: Palaearctic: Europe: AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland and Corsica), HU, IE, IT (mainland and Sicily), LV, MD, NL, NO, PL, PT, RO, RS, RU (Bashkortostan, Ivanovo, Karelia, Moscow, Leningrad, Lipetzk and Voronezh Regions), SE, SK, UA, UK (England); North Africa: TN; Asia: RU (Chechnya, Dagestan, Krasnodar and North Osetia Regions), TJ, TM, TR. UA: Cherkasy, Chernigiv, Chernivtsi, Kharkiv, Khmelnytsky, Kyiv, Luhansk, Lviv, Poltava, Sumy, Vinnytsia and Zakarpattya Regions.

Larvae parasitize earthworms (Kirchberg, 1954, 1961), but have also been reared as a saprophage from a dead snail *Limax* sp. (Pape, 1987) and maintained on mammal meat and liver in laboratory conditions (Baudet, 1982; Pollock, 1972). Imagoes prefer meadows, bushes, alp steppe, lowland flood-plain forests, limestone territories, chalk grasslands, suburban and urban gardens and parks (Allen, 1966; Kejval, 1998; Povolný & Verves, 1990, 1997; Rudzinski & Flügel, 2007) at altitudes up to 2100 m a. s. l. (Ziegler & Lange, 2001). This species was found to be an indicator for urban habitats during summer (Fremdt & Amendt, 2014). Adults prefer to visit the small invertebrate and vertebrate corpses (Blackith & Blackith, 1990), freshly killed piglet (Prado e Castro et al., 2011), flowers of *Anethum graveolens*, *Phalacrolooma annuus* and *Solidago canadensis* (Verves, 2003, 2010, 2013).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reserve, hill “Maryina Gora”, 220 m a. s. l., 20.05. & 16-26.06.2010, 18 ♂ (Yu. Protzenko, Yu. Verves). Uman City: “Sofiivka” dendrological park, 11.-14.06.2006, 7 ♂. Chernivtsi Region: Kitzman District: Stavchany village, 8.08.1959, 2 ♂ (O. Viktorov). Kyiv City: Dnipro District: Hydropark, bushes, 16.06.2010, 1 ♂; Holosiiv District: Baykove Cementery, 13.07., 30.09.2003 & 16.08.2004, 9 ♂; Chervonozyryany Avenue, school yard, at trunks of trees, 27.09.2006, 1 ♂; “Didorovsky” pond, humid banks, 25-28.08.1999, 5.07-28.08.2002 & 28.06.2004, 19 ♂; Kozacha street, on leaves and walls, 7.07.2005, 2 ♂; National Exhibition Centre, bushes, 27.08.1999 & 26.05.2002, 2 ♂; “Prospect Nauki” avenue, hills “Lysa Gora”, bushes, 19.08.2004, 2 ♂; “Sovky hole”, coast of pond, humid meadow, 31.07.-29.08.2002, 16.07.2003 & 27.08.2004, 5 ♂; “Teremky-3” residential community, 14.07.2001, 1 ♂; (Yu. Verves); “Theophania” park, nr building, 8.09.2014, 2 ♂; Uralska street, yard, 3-6.07.2009, 6 ♂ (A. Drozdovska); Vasylykivska street 33, yard, 5.07.-8.08. 2008, 29.07.2009 & 18.05.-7.07.2010, 38 ♂; Vasylykivska street 98, yard, 23.04.-20.09.2002, 225 ♂; *ibid.*, indoor of laboratory building, on windows, 28.10.2002, 3 ♂; Williams street, dry meadows, 10-

28.07.2001 & 19.08.2002, 7 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills, 21.05.2009, 3 ♂; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000 & 15.07.2005, 12 ♂; "Syretz" residential community, humid meadow nr pond, 3-4.06.2000 & 15.07.2005, 12 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 32 ♂. Kyiv Region: Bila Tzerkva City: "Oleksandriya" park, 3.05.2009, 1 ♂. Sumy Region: Romny City: banks of Romenka river, meadows and bushes, 21-27.08.2009, 3 ♂; Trostyanetz City: meadows and forest at lake coast, 3.08.1999, 1 ♂. Zakarpattia Region: Mizhghirya District: Kolochava village, 2-4 km S, bank of Kvasovetz stream, humid meadows, 600-1000 m a. s. l., 12.08.1995, 2 ♂ (Yu. Verves).

93. *Sarcophaga ukrainica* Rohdendorf, 1937

Distribution: Palaearctic: Europe: BG, HR, HU, PL, RO, RS, SK, UA: Dnipropetrovsk, Kharkiv, Kyiv, Odesa and Poltava Regions.

Flies prefer dry meadows and bottom and slopes of ravine in feather-grass steppe; baited on feces (Verves, 2000; Povolný & Verves, 1990, 1997).

Material examined: Dnipropetrovsk Region: Novomoskovsk District: Andriyivka village, Biospherical Station of Dnipropetrovsk University, 2 km N, steppe, 3-16.08.2000, 11 ♂. Kyiv Region: Obukhiv District: Velyki Dmytrovychi village, grass coast of stream, 27.06.1997, 1 ♂ (Yu. Verves).

94. *Sarcophaga variegata* (Scopoli, 1763)

Distribution: Palaearctic: Europe: AD, AL, AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland) GR, HR, HU, IE, IT (mainland, Sardinia and Sicily), LT, LU, LV, MD, MT, NL, NO, PL, PT, RO, RS, RU (Arkhangelsk, Bashkortostan, Chuvashia, Karelia, Leningrad, Lipetsk, Moscow, Novgorod, Voronezh and Yaroslavl Regions), SE, SK, UA, UK; North Africa: DZ, EG, MA; Asia: CN (Neimenggu, Xinjiang), EG (Sinai), GE, IL, IR, KG, KZ, MN, RU (Altai, Amur, Buryatia, Chechnya, Chita, Dagestan, Irkutsk, Kamchatka, Krasnoyarsk, Magadan, Orenburg, Novosibirsk, Primorye, Sakhalin, Tomsk, Tuva, Tyumen and Yakutia Regions), TJ, TR. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae develop in dead snails, insects, vertebrates (Verves & Khrokalo, 2006), included human remains (Introna et al., 1998), human faeces (Birg, 1971), rotten meat (Salwa & Abdel-Rahman, 1983; Sukhova, 1952) and liver (Rognes, 1986); are known as facultative parasites of earthworms *Allolobophora chlorotica* and *A. rosea* (Eberhardt & Steiner, 1952; Kirchberg, 1954, 1961), snails *Euparyphya pisana* (Berner, 1960), predators of lepidopteran pupae *Agrotis segetum* (Séguy, 1941), *Dendrolimus pini* (Yarmanshevich, 1970), *Hyphantria cunea* (Sikura, 1959), *Lymantria monacha* (Baer, 1921). Maggots are producers of facultative tissue myiasis of sheep (Sevgili et al. 2004b) and humans (Séguy, 1941), occasional intestinal myiasis of men (Emden, 1954). Adults prefer different types of meadows, mesophytic and humid forests, parks and gardens (Faucherre & Cherix, 1998; Verves & Khrokalo, 2006), chalk grasslands and limestone hillsides (Povolný, 1999; Rudzinski & Flügel, 2007) up to 2300-2500 m a. s. l. (Menzel & Ziegler, 2002; Ziegler & Lange, 2001). This species was found to be an indicator for urban habitats during summer (Fremdt & Amendt, 2014). Flies attracted to animal (Castillo Mirables, 2002) and human (Mohamed Aly et al., 2012) carcasses, rotten meat (Sevgili et al., 2004b), faeces and decomposed fruits (Shura-Bura, 1952), flowers of *Achillea millefolium*, *Anethum graveolens*, *Heracleum sibiricum*, *Phalacrologa annuus*, *P. septentrionale*, *Pyrethrum corymbosum*, *Solidago canadensis* (Verves, 2003, 2013), *Taraxacum officinale* (original data). Flies are vectors of dermatophytic fungus *Microsporum canis* (Pinetti et al., 1974) and *Salmonella* sp. (Greenberg, 1971).

Material examined: Cherkasy Region: Kaniv District: Keleberda village, 3 km E, humid forest near pond, 20.05.2002, 1 ♂; Kaniv State Nature Reserve, yard, at vegetation, 20.05-8.06.2003, 4 ♂; Uman City: "Sofiivka" dendrological park, 11.06.2005 & 13-14.06.2006, 20 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, shore of Trubin Lake, 12.07.2000, 1 ♂; Ichnya District: "Trostyanetz" Dendrological Park, meadows and forest at lake coast, 5-13.08.1999, 110 ♂ (Yu. Verves); Sosnytzia District: Khlopyanyky village,

forest border, 7-14.07.2003, 1 ♂ (L. Khrokalo). Crimea: Simferopol City: Gagarin Park, banks of Salgir River, meadows, 27.08.2004 & 9.05.2005, 2 ♂ (L. Khrokalo, Yu. Verves). Dnipropetrovsk Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, bred on dead mice, no further data, 1 ♂ (M. Shulman); Samara River, humid meadow, at flowers of *Heracleum* sp. & feather grass steppe, 4-10.08.2000, 21 ♂; Fedorivka village, meadows along Samara River, 1.08.2000, 7 ♂. Kyiv City: Desna District: "Druzhby Narodiv" park, meadows, 8.07.2005, 1 ♂; "Lisova" subway-station, 5 km E, mixed forest and bushes near Lake Lisove, 20.07.2004, 1 ♂; Dnipro District: Hydropark, bank of Berizka Lake, bushes, 22.06.2006 & 16.06.2010, 10 ♂ (Yu. Verves); Moscow Bridge, 2 km N, unnamed island, 16.05.2008, 1 ♂ Rayduzny Massive, bank of Malynivka Lake, bushes, 23.06.2005, 5 ♂; (L. Khrokalo), Holosiiv District: Baykove Cementery, 13.07.-24.09.2003 & 16.08.2004, 61 ♂; "Didorovsky" pond, humid banks, 21.09.2003, 28.06.2004 & 12.09.2005, 17 ♂; "Holosiiv" Park in memory of M. Rylsky, 10.06.2009, 3 ♂; Kozacha street, on leaves and walls of buildings, 7.07.2005, 5 ♂; National Exhibition Centre, bushes, 27.08.1999 & 26.05.2002, 11 ♂ (Yu. Verves); "Prospect Nauki" avenue, hills "Lysa Gora", bushes, 26.07.2002, 8.05.2003 & 17-18.08.2004, 34 ♂ (A. Drozdovska, Yu. Verves); "Sovky hole", humid meadow, 10.09.2000, 30.07., 29.08.2002, 27.06, 16.07.2003, 3.05., 27.08.2004 & 9.06.2011, 42 ♂; "Theophania" park, board of humid forest near pond, 11.05.-1.09.2002, 22.05.2008, 19.06.-29.07.2013 & 8.09.2014, 106 ♂ (Yu. Verves); Uralska street, yard, 3-6.07.2009, 12 ♂ (A. Drozdovska); Vasylykivska street 33, yard, 23.06.-8.08.2008, 18.05.-2.10.2009, 5.05.-28.07.2010, 145 ♂; Vasylykivska street 98, yard, 11.04.-30.09.2002, 341 ♂, 1 ♀ (one pair was collected in copula 11.04); indoor of laboratory building, on windows, 5.09.-28.10.2002, 3 ♂; Williams street, dry meadows, 10-28.07.2001, 25.04.-19.08.2002 & 20.08.2003, 66 ♂; Obolon District: Verbne Lake, sandy bank, 31.08.2004, 1 ♂; Pechersk District: Kyiv-Pechersk Lavra, 21.05.2009, 12 ♂; Podil District: Shevchenko square, humid meadow nr pond, 3-4.06.2000, 15.07.2005 & 27.09.2006, 13 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-28.8.2003, 85 ♂. Kyiv Region: Bila Tzerkva City: "Oleksandria" dendrological park, 3.05.2009, 2 ♂; Boryspil District: Rozhny village, bushes, 19.08.1999, 2 ♂; Kyiv-Sviatoshyn District: Hostomel village, meadows, 8.07.2001, 14 ♂; Irpin City, forest nr bog, 26.04.2003, 7 ♂; Kruglyk village, meadow nr pond, 30.04.2000, 1 ♂; Moshchun village, humid meadows near forest stream, 8.09.2003, 8 ♂; Pyrogiv village, field museum, 24.08.1999 and 28.05.2000, 4 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 4.06.2003, 1 ♂; Obukhiv District: Tatzenky village, 14.09.2003, at leaves and ground at border of pine forest, 3 ♂; Ukrainka City, 21.08.2004, at leaves, 1 ♂; Velyki Dmytrovychi village, asp forest nr bog, 4.07.1999, 2 ♂; Rokytne District: Busheve village, 49°39'N/30°35'E, open cast, 27.07.2012, 1 ♂. Poltava Region: Pyryatyn District: Davydivka village, meadows, 15.07.2009, 1 ♂; Grabarivka village, meadows near Ruda River, 15.07.2009, 7 ♂ (Yu. Verves); Gurbyntzi village, on flowering *Apiaceae*, 18-23.07.2005, 7 ♂; Kroty village, 8.07.08, 1 ♂ (A. Drozdovska); Keybalivka village, meadows near Uday River, 12-15.07.2009, 2 ♂; Kharkivtzy village, locality "Velyki Solontzi", 13-14.07.09, 1 ♂. Sumy Region: Romny City: banks of Romenka River, meadows and bushes, at flowers of *Taraxacum officinale*, 21-30.08.2009 & 5.05.2013, 47 ♂ (Yu. Verves); Sumy District: Vakolovshchyna village, humid meadow, 18, 31.05.2006 & 5.14.06.2007, 6 ♂ (O. Govorun); Trostyanetz City: meadows and forest at lake coast, 3.08.1999, 2 ♂. Vinnitsia Region: Chechelnyk District: Chechelnyk City, 4.5 km S, "Karmelyuk's Podillya" National Nature Park, "Vyshenke" locality, 26-27.05.2014, 1 ♂ (V. Gorobchyshyn). Zakarpattia Region: Mizhgirya District: Kolochava village, 500 m a. s. l., board of beech forest near Biological station, 14-15.08.1995, 10 ♂; 2-4 km S, along Kvasonetz Stream, 500-1000 m a. s. l., humid meadows, 12, 17.08.1995, 22 ♂; 5 km W, 1000-1400 m a. s. l., alp steppe, 14-15.08.1995, 48 ♂; 7 km SE, 1200 m a. s. l., "Krasna" alp steppe, 16.08.1995, 54 ♂; Uzhgorod District: Nyzhne Solotvyno village, meadows and beech forest, 98°33'N, 22°26'E, 140-200 m a. s. l., 16-23.08.2014, 23 ♂ (Yu. Verves). Zhytomyr Region: Zhytomyr City, coast of Teteriv River, 17.05.1988, 1 ♂ (S. Zrazhevsky).

/ *Sarcophaga wiesenthali* Lehrer, 1989

Distribution: Palaearctic: Europe: RO, SK*

Material examined: Slovakia: Veľký Inovec, 20.06.1957, 1 ♂ (M. Slamečková); Údolie Nitry, 19.08.1957, 1 ♂ (Pristachová) /

95. *Sarcophaga zumptiana* Lehrer, 1959

Distribution: Palaearctic: Europe: AT, BA, CZ (Moravia), FR (mainland); HR, HU, RO, RS, SK, UA: Ivano-Frankivsk and Zakarpattya Regions.

This species in mountains occurs from termophilous oak and beech forests stands up to subalpine elevations. It was discovered wherever natural deciduous forests of various vegetation tiers (Povolný & Šustek, 1983; Povolný & Verves, 1997).

Material examined: Zakarpattya Region: Mizhgirrya District: Kolochava village, 500 m a. s. l., board of beech forest near Biological station, 14.08.1995, 1 ♂; 7 km SE, 1200 m a. s. l., "Krasna" alp steppe, 16.08.1995, 2 ♂ (Yu. Verves).

Subtribe Boettcheriscina**96. *Kramerea schuetzei* (Kramer, 1909)**

Distribution: Palaearctic: Europe: AT, BG, BY, CH, CZ (Bohemia and Moravia), DE, FR (mainland), HR, HU, IT (mainland), MD, MK, NL, RS, RU (Bashkortostan, Belgorod, Ivanovo, Kaliningrad, Karelia, Leningrad, Lipetzk, Moscow and Voronezh Regions), SK, UA; Asia: AZ, CN (Beijing, Gansu, Heilongjiang, Henan, Jilin, Liaoning, Neimenggu, Shaanxi, Shanxi and Sichuan), JP (Hokkaido, Honshu, Kyushu and Shikoku), KP, KR, KZ, MN, RU (Altai, Amur, Buryatia, Chita, Jewish Autonomy, Khabarovsk, Kurily Is., Novosibirsk, Primorye, Sakhalin and Tuva Regions). Oriental: TW. UA: Cherkasy, Chernigiv*, Crimea, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kyiv, Poltava*, Volyn, Zakarpattya and Zhytomyr Regions.

Larvae are bred in small animal carcasses: dead snails (Kühlhorn, 1986), beetles, mice, birds, fishes (Artamonov, 1983; Kano et al., 1967), rotten meat (Verves & Khrokalo, 2006) and known as facultative predators of lepidopteran pupae, occasionally caterpillars: e. g. *Aporia crataegi* (Kolomyietz, 1958), *Arctia* sp. (Lehrer & Dobrivojević, 1969), *Cosmotriche potatoria* (Zinovyev, 1962), *Dasychira albodentata* (Ivliev & Sinchylina, 1964; Nakonechny, 1973a; Zinovyev, 1962), *Dendrolimus pini* (Baer, 1921; Khitzova, 1968), *D. sibiricus* (Boldaruev, 1952; Kolomyietz, 1952, 1958; Orlov & Yurchenko, 1978; Zinovyev, 1962), *D. spectabilis* (Kano et al., 1967), *Dictyoploca japonica* (Artamonov, 1978), *Lymantria dispar* (Artamonov, 1988; Baranov, 1942; Čápek & Čepelák, 1970; Girfanova, 1962; Khanislamov et al., 1958; Nakonechny, 1973a; Novotný et al., 1998; Tabakovic-Tosic et al., 2013; Tereshkin & Lobodenko, 1997), *L. monacha* (Artamonov, 1983, 1988; Baer, 1921; Kolomyietz, 1958; Kramer, 1909; Nakonechny, 1973a; Povolný, 1988), *Orgyia antiqua* (Nakonechny, 1973a), *Pygaera anastomosis* (Egorov, 1962), *Selenephra lunigera* (Nakonechny, 1973a), and adult cicada *Graptopsaltria nigrofuscata* (Hayashida, 2013). Flies prefer lowland flood-plain forests (Kejval, 1998) and forest-steppes up to 1500 m a. s. l. (Povolný & Verves, 1997); common in villages; hemisynanthropic species (Artamonov, 1987; Rohdendorf, 1959). Imago feed at sweat of man, mucous secrets from mouth and nose of hoof animals, haemolymph of wounded insects (Artamonov, 1992), faeces, rotten meat and fruits (Verves et Khrokalo, 2006), flowers of *Pimpinella saxifraga* (Girfanova, 1958d), *Chaerophyllum* sp., *Daucus* sp., *Pastinaca* sp. (Séguy, 1941).

Material examined: Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin lake, 8-11.07.2000, 2 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 5.08.1999, 1 ♂. Kyiv City: Holosiiv District: Vasylykivska street 98, yard, 18.06.2002, 1 ♂; Pechersk District: Kyiv-Pechersk Lavra, bushes at hills near, 21.05.2009, 1 ♂. Poltava Region: Pyryatyn District: Grabarivka village, meadows nr Ruda river, 15.07.2009, 1 ♂. Zakarpattya Region: Uzhgorod District: Nyzhne Solotvyno village, tip of hill, beech forest, 98°33'N, 22°26'E, 200 m a. s. l., 22.08.2014, 1 ♂ (Yu. Verves).

97. *Rosellea aratrix* (Pandellé, 1896)

Distribution: Holarctic: Europe: AL, AT, BA, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland and Corsica), HR, HU, IE, IT (mainland and Sicily), LT, LV, MD, NL, NO, PL, RO, RS, RU (Bashkortostan, Ivanovo, Karelia, Leningrad, Lipetzk, Moscow and Voronezh Regions), SE, SK, UA, UK; Asia: AZ, CN (Liaoning and Neimenggu), GE, KZ, RU (Altai,

Amur, Buryatia, Irkutsk, Kamchatka, Khabarovsk, Krasnodar, Magadan, Stavropol, Tomsk and Tuva Regions), TR; North America: CA (Manitoba), US (Alaska). Oriental: VN. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Ivano-Frankivsk, Kharkiv, Kherson, Kirovograd, Kyiv, Mykolaiv, Odesa, Poltava, Sumy, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are predators and develop in dead snails (Kühlhorn, 1986), insect and small animal carcasses (Blackith & Blackith, 1984), e. g. carabid beetles, mice, birds (Blackith et al., 1994); known as facultative parasites of imago of cerambycid beetle *Prionus coriarius* (Salaas, 1943), predators of necrobiontic maggots (Blackith & Blackith, 1984), and pupae of moth *Lymantria monacha* (Kramer, 1909); in the laboratory conditions reared on beef (Richet et al., 2011). Adult flies common in humid forests, sometimes on meadows (Gunárová & Slamečková, 1966; Trofimov, 1969), associated with limestone territories or lowland flood-plain forests (Kejval, 1998) at altitudes up to 1200 m (Kano et al., 1999). This species tends towards culturophily (Povolný & Verves, 1997). Imagoes feed at faeces, rotten meat, rotten fruits (Gregor & Povolný, 1961), aphid excretata (Verves & Khrokalo, 2006), flowers of *Solidago canadensis* (Verves, 2013).

Material examined: Cherkasy Region: Kaniv District: Trakhtemyriv village, 07.1988, 1 ♂ (S. Zrazhevsky); Zarichchya I., 30.07.1968, 2 ♂ (O. Viktorov-Nabokov); Uman City: "Sofiivka" dendrological park, 11.06.2005 & 14.06.2006, 3 ♂. Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 7.07.-25.08.2000, 60 ♂; Ichnya District: "Trostyanetz" dendrological park, meadows and forest at lake coast, 4-11.08.1999, 8 ♂ (Yu. Verves). Crimea: Big Alushta District: Rybache village, "Kanakaska Balka" hollow, meadows, 5-8.05.2005, 3 ♂ (L. Khrokalo). Kyiv City: Dnipro District: Hydropark, nr Berizka Lake, bushes, 22.06.2006 & 16.06.2010, 2 ♂ (Yu. Verves); Holosiiv District: "Didorovsky" pond, humid banks, 25.08-5.09.1999, 11.07-9.08.2002 & 21.09.2003, 23 ♂ (A. Drozdovska, Yu. Verves); "Holosiiv" park in memory Maxym Rylsky, 10.06.2009, 20 ♂, 2 ♀; Kozacha street, on leave, 7.07.2005, 1 ♂; National Exhibition Centre, bushes, 27.08.1999, 2 ♂; Olzhyn I. at Dnipro, 10 km S of Kharkiv Bridge, 16.09.2009, 4 ♂; "Sovky hole", humid meadow, 10.09.2000, 27.06.2003, 3.05.2004 & 9.06.2011, 6 ♂; "Theophania" park, 19.06. 2013, 3 ♂; 15.10.014, 1 ♀; Vasylkivska street 33, yard, 28.05.2009, 1 ♂; Vasylkivska street 98, yard, 15.05.-21.06.2002, 7 ♂; Williams street, dry meadows, 12.08.2002, 1 ♂; Podil District: Shevchenko square, humid meadow, 3-4.06.2000 and 15.07.2005, 11 ♂; Solomyanka District: Strazhesko Hospital territory, at roads and leaves, 21-27.8.2003, 1 ♂. Kyiv Region: Bila Tzerkva City: "Oleksandria" dendrological park, 3.05.2009, 1 ♂; Boryspil District: Rozhny village, bushes, 15-16.08.1999, 4 ♂; Brovary District: Zazymya village, meadow, 1.08.2001, 1 ♂; Myronivka District: Tulyntzy village, feather-grass steppe with bushes, 15.06.2004, 2 ♂; Obukhiv District: Velyki Dmytrovychi village, asp forest nr bog, 4.07.1994, 27.06.1997 & 4.07.1999, 4 ♂. Poltava Region: Pyryatyn District: Grabarivka village, meadows near Ruda River, 15.07.2009, 1 ♂; Keybalivka village, meadows nr Uday River, 17.07.2009, 1 ♂. Sumy Region: Romny City: banks of Romenka River, meadows and bushes, 21-27.08.2009, 5 ♂. Zakarpattia Region: Mizhgirya District: Kolochava village, 500 m a. s. l., board of beech forest near Biological station, 14.08.1995, 1 ♂; 2-4 km S, along Tereblya River, 500 m a. s. l., humid meadows, 12 and 17.08.1995, 2 ♂; 3 km SE, along Kvazovetz Stream, 700 m a. s. l., humid meadows, 14.08.1995, 1 ♂; 5 km SE, 1000 m a. s. l., board of beech forest, 15.08.1995, 1 ♂; Uzhgorod District: Nyzhne Solotvyno village, meadows and beech forest, 98°33'N, 22°26'E, 140-200 m a. s. l., 16-23.08.2014, 21 ♂. Zaporizhzhya Region: Melitopol City, "Kamyany Mogyly" State Reservation, at stones, 28.08.1997, 1 ♂ (Yu. Verves).

Tribe Raviniini Subtribe Raviniina

98. *Ravinia pernix* (Harris, 1780)

Distribution: Palaearctic: Europe: AD, AL, AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland and Corsica), GR, HR, HU, IE (Clare I.), IT (mainland, Sardinia and Sicily), LT, LV, MD, MNE, MT, NO, NL, PL, PT, RO, RS, RU (Astrakhan, Bashkortostan, Chuvashia, Ivanovo, Karelia, Kursk, Leningrad, Lipetzk, Moscow, Murmansk, Nizhny Novgorod, Novgorod, Tatarstan, Voronezh and Yaroslavl Regions), SE, SK, TR, UA, UK; North Africa: DZ, ES (Canary Is.), EG, LY, MA, PT (Azores), TN; Asia: AF, AM, AZ, CN (Beijing, Gansu, Hebei,

Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Neimenggu, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Tianjin and Xinjiang), CY, EG (Sinai), GE, IL, IQ, IR, JO, JP (Hokkaido and Honshu), KG, Korean Peninsula, KZ, LB, MN, RU (Altai, Amur, Buryatia, Chechnya, Dagestan, Ingushetia, Irkutsk, Kabardi-Balkaria, Kamchatka, Karachay-Cherkessia, Khabarovsk, Koryakia, Krasnodar, Kurily, Magadan, North Osetia, Novosibirsk, Primorye, Sakhalin, Stavropol, Tomsk, Tuva and Yakutia Regions), SA, SY, Tibet, TJ, TM, TR, UZ. Oriental: BD, BT, CN (Guizhou, Hunan and Yunnan), IN (Andra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Jammu and Kashmir, Uttar Pradesh, West Bengal), NP, PK (Punjab). Afrotropical: TD, YE. UA: Cherkasy, Chernigiv, Chernivtsi, Crimea, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kyiv, Luhansk, Lviv, Mykolaiv, Odesa, Poltava, Rivne, Sumy, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are coprophagous, related to both human and animal faeces, lavatories, garbage, dung, rarely have been found in dead snails and mammals (Gadzhey, 1963; Kirchberg, 1961; Martínez-Sánchez et al., 2000b; Papp, 1971; Povolný & Verves, 1997; Richet, 1990; Rohdendorf, 1937; Sychevskaya, 1957, 1960, 1970; Tantawi et al., 1996; Trofimov, 1969; Verves, 1985; Zakharova, 1961), including humans corpses (Velásquez et al., 2010); facultative predators of other shizophagous maggots (Pickens, 1981); caused occasional intestinal and facultative wound myiasis of men (James, 1947; Nandi, 2002; Sevgili et al., 2004b), known as facultative parasitoids of snail *Cantareus aspersus* (Verves, 2013), adult locusts *Chrysochraon dispar*, *Dociostaurus maroccanus*, *Podisma albina* (Callot, 1935; Séguy, 1941), caterpillars and pupae of *Loxostege sticticalis* (Verves, 1974), *Lymantria dispar* (Nakonechny, 1973a), *L. monacha* (Bengtsson, 1902; Nakonechny, 1973b), larvae of beetle *Oryctes nasicornis* (Baer, 1921). Adult flies prefer steppe, hemi-deserts, meadows, forest borders and settlements; hemisynanthropic species (Aivasova & Saphonova, 1973; Artamonov, 1983; Charykuliev, 1965; Povolný & Verves, 1990, 1997; Sychevskaya, 1966; Trofimov, 1969); in mountains up to 4800 m a. s. l. (Sychevskaya, 1970). Imago feed on faeces, dung, decomposed fruits (Birg, 1971; Shura-Bura, 1952), human food (Sukhova, 1952), dead birds, rodents (Artamonov, 1993), piglets (Prado e Castro et al., 2011), aphid excreta and flowers of *Calluna vulgaris*, *Cornus sanguine*, *Euphorbia cyparissias*, *Prunus spinosa*, *Senecio vernalis* (Draber-Moňko, 1973). Flies are known as passive vectors of bacteria *Shigella flexneri* (Greenberg, 1971), dysentery bacillus "Flexner strain, type F" (Sychevskaya et al., 1959), vegetative cells and cysts of protozoan *Chilomastix mesnili* and *Lamblia intestinalis* (Trofimov & Engelhardt, 1965), oncosphaerae of tapeworms, e. g. *Taeniarhynchus saginatus* (Nadzharov, 1967).

Material examined: Cherkasy Region: Chornobaiv District: Velyka Burivka, 6.07.1988, 2 ♂; Uman City: "Sofiivka" dendrological park, 11.06.2005, 1 ♀ (Yu. Verves); Zhazkiv District: Yurkivka village, meadow, 7.05.1989, 1 ♀; Zhazkiv City, 16 km E, 6.05.1989, 1 ♂; Zolotonosha District: Kropyvnia village, 16.06.1988, 1 ♀; Tyasmyn River, 45 km NE of source, 5.07.1988, 1 ♀ (S. Zhrazhevsky). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 11.06.-18.08.2000, 3 ♂, 4 ♀; Ichnya District: "Trostyanyet" Dendrological Park, meadows and forest at Lake coast, 5-13.08.1999, 19 ♂, 3 ♀. Crimea: Bakhchysaray District: Beregoe village, sandy area, 4.08.2004, 1 ♀ (Yu. Verves); Big Alushta District: Rybacha village, "Kanakaska Balka" hollow, meadows, 5-8.05.2005, 1 ♀ (L. Khrokalo). Dnipropetrovsk Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, bank of Samara River, meadows, at flowers of *Heracleum* sp., & feather grass steppe, 1.-8.08.2000, 8 ♂, 2 ♀. Kherson Region: Gola Prystan District: Chornomorsky State Reserve, Rybalchasnsky branch, near living buildings, 24.07.2006, 1 ♂ (Yu. Verves); Skadovsk District: Novo-Oleksiyivka village, near pig farm, at destroyed melon, horse and pig dung, 4.-5.09.1961, 25 ♂, 12 ♀ (O. Viktorov-Nabokov). Kyiv City: Dnipro District: Hydropark, nr Berizka Lake, 22.06.2006, 1 ♂; Holosiiv District: Baykove Cementery, 24.09.2003, 1 ♀; Dyky island at Dnipro, sandy area, N 50°17'02", E 30°39'22" 6.10.2011, 1 ♀; Vasylykivska street 33, yard, 8.08.2008, 1 ♀; Podil District: Shevchenko square, humid meadow nr pond, 15.07.2005, 1 ♂. Kyiv Region: Boryspil District: Rozhny village, bushes, 15.08.1999, 2 ♂; Brovary District: Zazymya village, bushes, 1.08.2001, 2 ♂; Kyiv-Sviatoshyn District: Moshchun village, humid meadows near forest stream, 8.09.2003, 1 ♂; Obukhiv District: Tatzenky village, 14.09.2003, at leave, 1 ♂; Ukrainka City, at ground at border of pine forest, 21.08.2004, 1 ♂; Velyki Dmytrovychi village, asp forest nr bog, 4.07.1999, 2 ♂ (Yu. Verves); Skvyra District: Pustovarivka village, 26-27.06.2004, 1

♂, 1 ♀ (A. Drozdovska); Vyshgorod District, Osischyna village, meadows, 3.06.2007, 1 ♂ (Yu. Verves). Mykolaiv Region: Berezanka District: Tiligul lyman, sandy coast, 12.06.1985, 27.07.1987, 30.04., 22.05. and 20.06.1988, 3 ♂, 4 ♀ (S. Zrazhevsky); Ochakiv District: Parutino village, debris of antic City Olvia, 16.07.2006, 6 ♂, 1 ♀ (Yu. Verves). Odesa Region: Ismail District: Kyslytzya village, 9.08.2009, 1 ♂; Suvorove village, 20-23.08.2009, 2 ♂ (V. Corobchyshyn). Poltava Region: Pyryatyn District: Bilotzerkivtzi village, “Murentzeve” locality, 15.08.2010, 4 ♂; Grabarivka village, meadows near Ruda River, 15.07.2009, 1 ♂; Gurbyntzi village, on flowering *Apiaceae*, 18.07.2005, 2 ♀; Kaplyntzi village, meadows, 13.07.2009, 1 ♂; Keybalivka village, meadows at bank of Uday River, 11.-14.07.2009, 4 ♂; 14.07.2012, 2 ♂; Lelyaky village, meadows at bank of Uday River, 12.08.2010, 6 ♂, 1 ♀; 28.05.2013, 3 ♂, 1 ♀; Polstvin village, 17.7.2007, 1 ♂ (A. Drozdovska, V. Gorobchyshyn, Yu. Protzenko, O. Tkachenko, Yu. Verves). Sumy Region: Serechnya Buda District: Desnyansko-Starogutsky National Nature Park, 3.-4.08.2013, 4 ♂, 1 ♀; Sumy District: Mogrytzya village, 7-9.08.2009, 3 ♂ (Yu. Protzenko); Romny City: banks of Romenka River, meadows and bushes, 21-27.08.2009, 2 ♂; Trostyanetz City: meadows and forest at Lake coast, 3.08.1999, 2 ♂. Vinnitsia Region: Chechelnyk District: Chechelnyk Sity, 4,5 km S, “Karmelyuk's Podillya” National Nature Park, “Vyshenke” locality, 26-27.05.2014, 1 ♂; Chervona Greblya village, 7.07.2013, 1 ♂, 1 ♀; Lyubashivka village, 5.07.2013, 1 ♂ (V. Gorobchyshyn). Zakarpattia Region: Mizhghirrya District: Kolochava village, 500 m a. s. l., board of beech forest near Biological station, 14.08.1995, 1 ♂; 2-4 km S, along River Tereblya, 500 m a. s. l., humid meadows, 12.08.1995, 1 ♂; 5 km W, 1000-1400 m a. s. l., alp steppe, 14.08.1995, 2 ♂; 7 km SE, 1200 m a. s. l., “Krasna” alp steppe, 16.08.1995, 1 ♂; Uzhgorod District: Nyzhne Solotvyno village, meadow, 98°33'N, 22°26'E, 140 m a. s. l., 23.08.2014, 1 ♂. Zaporizhzhya Region: Akymivka District: Bogatyrsk biological station of Melitopol State Pedagogical University, meadows and bushes, 4-15.06.2008, 1 ♂, 1 ♀; Pryazovske District: Stepanivka village, sandy coast of Azov sea, 24-27.08.1997, 2 ♂, 4 ♀ (Yu. Verves).

Tribe Johnsoniini Subtribe Sarcotachinellina

99. *Sarcotachinella sinuata* (Meigen, 1926)

Distribution: Holarctic: Europe: AL, AT, BE, BG, BY, CH, CZ (Bohemia and Moravia), DE, DK, EE, ES, FI, FR (mainland), HR, HU, IE, IT (mainland), LV, MD, NL, NO, PL, RO, RS, RU (Astrakhan, Ivanovo, Kaliningrad, Leningrad, Moscow, Voronezh and Yaroslavl Regions), SE, SK, UA, UK; Asia: AZ, CN (Liaoning, Qinghai and Shaanxi), GE, IL, KZ, MN, RU (Altai, Amur, Dagestan, Khabarovsk, Krasnodar, Primorye and Yakutia Regions), TJ, TR, UZ; North America: CA (Alberta, British Columbia, Northwest Territories, Ontario and Quebec), US (Alaska, California, Colorado, Connecticut, Florida, Idaho, Illinois, INna, Iowa, Maine, Massachusetts, Michigan, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Utah and Washington). UA: Cherkasy, Chernigiv, Chernivtsi, Dnipropetrovsk, Donetsk, Ivano-Frankivsk, Kharkiv, Kherson, Khmelnytsky, Kirovograd, Kyiv, Odesa, Poltava, Sumy*, Ternopil, Vinnytsia, Volyn, Zakarpattia, Zaporizhzhya and Zhytomyr Regions.

Larvae are bred in liver, dead snails, insects, amphibies and rodents (Artamonov, 1983, 1993; Blackith & Blackith, 1990; Blackith et al., 1994). They were found in nests of birds, e. g. *Dymetella carolinensis* and caused myiasis of *Passer montanus* (Pape, 1987). Maggots are known as facultative internal parasitoids of pond snail, *Lymnaea palustris* (Judd, 1957), imagoes of locusts¹⁷, e. g. *Camnula pellucida*, *Dociostaurus maroccanus*, *Melanoplus bivittatus* (Rees, 1973), *M. differentialis* (Aldrich, 1916), *M. sanguinipes* (Rees, 1973), pupae of moth *Nomagria typhae* (Pape, 1987). Imagoes prefer humid meadows, bogs, reservoir banks, chalk grasslands and limestone hillsides (Judd, 1970; Kejval, 1998; Rudzinski & Flügel, 2007), and attracted to faeces and rotten meat (Aradi & Mihályi, 1971; Verves & Khrokalo, 2006), feed at flowers of *Angelica silvestris* and *Prunus spinosa* (Draber-Moňko, 1973).

Material examined: Cherkasy Region: Kaniv District: Kaniv State Nature Reservation, coast of Dnipro, 19.08.1988, 2 ♂ (S. Zrazhevsky). Chernigiv Region: Borzna District: Yaduty village, Biological Station of Nizhyn University, pine forest near Trubin Lake, 11.06.-19.08.2000, 29 ♂, 4 ♀; Ichnya District: “Trostyanetz” dendrological park, meadows and forest at coast of lake,

¹⁷ Females infected only flying grasshoppers (Rees, 1973).

6.08.1999, 2 ♂ (Yu. Verves). Dnipropetrovsk Region: Novomoskovsk District: Fedorivka village, meadows along Samara River, 1.08.2000, 2 ♂. Kyiv City: Desna District: “Lisova” subway-station, 5 km E, mixed forest and bushes near Lake Lisove, 20.07.2004, 1 ♂; Holosiiv District: “Didorovsky” pond, humid meadows, 12.09.2005, 3 ♂; Kozachy I. at Dnipro, 12 km S of Kyiv City, 9.09.2009, 1 ♂; “Sovky hole”, humid meadow, 10.09.2000, 31.07.2002, and 27.06.2003, 6 ♂; Zhukiv I. 20 km S of Kyiv, 9.09.2002, 1 ♂; Obolon District: Verbne Lake 31.08.2004, 1 ♂; Podil District: Shevchenko square, humid meadow nr pond, 15.07.2005, 1 ♂. Kyiv Region: Boryspil District: Rozhny village, bog, 16-22.08.1999, 45 ♂, 17 ♀; Kyiv-Sviatoshyn District: Irpin City, 2-4 km E, forest nr bog, 26.04.2003, 2 ♂ (Yu. Verves); Obukhiv District: Kozyn City, Kozynka River coast, bushes, 14.09.2003, 1 ♂; Skvyra District: Pustovarivka village, 26-27.06.2004, 1 ♀ (A. Drozdovska). Ivano-Frankivsk City: 7.07.1966, 1 ♀ (G. Nikitenko). Poltava Region: Pyryatyn District: Kaplyntzi village, humid meadow, 13.07.2009, 1 ♂; Masalske village, meadows at bank of Uday River, 14.08.2010, 1 ♂. Sumy Region: Romny City: banks of Romenka River, meadows and bushes, 21-30.08.2009, 5 ♂, 2 ♀ (Yu. Verves); Serednya Buda District: Desnyansko-Starogutsky National Nature Park, 31.07.2013, 1 ♂ (Yu. Protzenko).

Discussion

The full numbers of sarcophagid species are given in Table 1, including materials of present and last previous (Verves & Khrokalo, 2014) articles. The degree of knowledge of the sarcophagid fauna varies among the oblasts. More than 90% of a presumed number of species are presently known for Cherkasy (103 species), Kyiv Region (98), Kyiv City (90), and the Autonomous of Krym (Crimea) (96). Some more than 50% but less than 90 % of the total are known for Chernihiv (73), Chernivtsi (61), Dnipropetrovsk (69) Ivano-Frankivsk (58), Kharkiv (83), Kherson (87), Luhansk (45), Mykolaiv (49), Odesa (57), Poltava (81), Zakarpattia (68) Zaporizhzhya (75), and Zhytomyr (51) Regions. The sarcophagid fauna is poorly studied (not exceeding 50%) in Donetsk (39), Khmelnyzky (29), Kirovograd (38), Lviv (29), Rivne (17), Sumy (45), Ternopil (31), Vinnytsia (31), and Volyn (34) Regions. The quantity of known species from Ukraine (179) includes not less than 90% of real special composition.

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Table 1: The quantity of known species for Ukraininan regional and general faunas

no	region	number of species					
		Macronychiinae	Miltogramminae	Eumacronychiinae	Paramacronychiinae	Sarcophaginae	Sarcophagidae, sum
1	Cherkasy	(5) ¹⁸ 5	(30) ¹⁹ 33	(1) 1	(8) 8	(55) 56	(99) 103
2	Chernigiv	(3) 3	(24) 26	-	(7) 7	(32) 38	(66) 73
3	Chernivtsi	(2) 2	(4) 4	-	(3) 3	(50) 52	(59) 61
4	Crimea	(3) 3	(23) 30	(1) 1	(9) 10	(51) 52	(87) 96
5	Dnipropetrivsk	(6) 6	(19) 19	-	(5) 5	(36) 39	(66) 69
6	Donezk	(2) 6	(9) 9	-	(3) 4	(20) 20	(34) 39
7	Ivano-Frankivsk	(2) 2	(6) 6	-	(5) 5	(43) 45	(56) 58
8	Kharkiv	(5) 5	(24) 24	(1) 1	(10) 10	(34) 34	(83) 83
9	Kherson	(1) 1	(30) 30	(1) 1	(9) 9	(46) 46	(87) 87
10	Khmelnizky	-	(5) 5	-	(5) 5	(19) 19	(29) 29
11	Kirovograd	(2) 2	(11) 11	-	(2) 2	(23) 23	(38) 38
12	Kyiv City	(6) 6	(29) 29	(1) 1	(8) 8	(46) 46	(90) 90
13	Kyiv Region	(4) 4	(29) 29	(1) 1	(10) 10	(54) 54	(98) 98
14	Luhansk	(1) 1	(6) 17	(0) 1	(4) 7	(19) 19	(30) 45
15	Lviv	(2) 2	(7) 7	-	(4) 4	(16) 16	(29) 29
16	Mykolaiv	(1) 1	(10) 16	(1) 1	(4) 4	(26) 27	(42) 49
17	Odesa	(1) 1	(13) 17	(0) 1	(4) 5	(31) 33	(49) 57
18	Poltava	(1) 1	(24) 26	-	(7) 9	(41) 45	(73) 81
19	Rivne	(2) 2	(0) 1	-	(1) 1	(13) 13	(16) 17
20	Sumy	(3) 3	(7) 13	-	(1) 5	(17) 24	(28) 45
21	Ternopil	(1) 1	(6) 6	-	(2) 2	(18) 22	(27) 31
22	Vinnitsia	(2) 2	(5) 5	-	(2) 2	(15) 22	(24) 31
23	Volyn	(1) 1	(4) 4	-	(3) 3	(26) 26	(34) 34
24	Zakarpattia	(2) 2	(9) 9	-	(4) 4	(49) 53	(64) 68
25	Zaporizhzhya	(1) 1	(26) 26	-	(9) 9	(38) 39	(74) 75
73	Zhytomyr	(2) 2	(13) 13	-	(5) 5	(31) 31	(51) 51
Sum		(8) 8	(56) 56	(1) 1	(15) 15	(95) 99	(175) 179

¹⁸ Results according to literature data.¹⁹ Results included literature and original data.

Addendum & Corrigendum

Muhabbet Kemal Ahmet Ömer Koçak

In the previous number of this serial, the authors published erroneously the name of a pentatomid bug as “*Dolycoris baccharum* (Fig.21)”. This name must be changed to “*Codophila varia*”.

Among the pentatomid species, *Dolycoris baccharum* is one of the widely distributed species in Turkey, but its occurrence in Malatya Province must be deleted for the time being. On the other hand, the genus *Codophila* is represented by two species in the West Palearctic; namely, *varia* and *maculicollis*. The former is also widely distributed in Turkey; the latter is known from North Africa, partly in Middle East, and Armenia in the Caucasus. Its occurrence in Turkey is highly probable, but not reported in this country so far. For that reason, in order to be sure about the identity of the specimen taken from Malatya, the preparation of the male genitalia has been made by the first author (**Fig.1**). Number of the short setae at the base of the hypophysis and the shape of pygophore in the male genitalia reveal that the specimen belongs to *C. varia*.



Fig. 1 – Male genitalia of *Codophila varia* (Pentatomidae, Hemiptera) from Malatya Prov. (Beydağı NP) (GP0043MK). Aedeagus and parameres. Short setae at the base of hypophysis are less than 7. As a diagnostic character, number of these short setae in *Codophila maculicollis* is between 30-40, while 4-7 in *C. varia* (Ribes & Pagola-Carte, 2013: 202).

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